OM-4401 198 521M

May 2002

Processes

MIG (GMAW) Welding

Flux Cored (FCAW) Welding

Stick (SMAW) Welding

TIG (GTAW) Welding

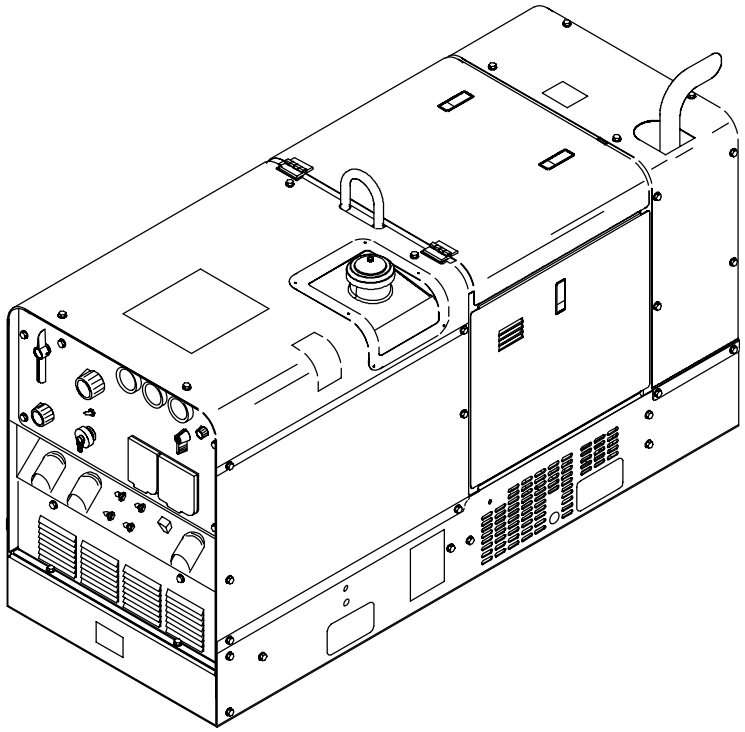
Air Plasma Cutting and Gouging with Spectrum® Unit

Air Carbon Arc (CAC-A) Cutting and Gouging

Description

Engine Driven Welding Generator

Trailblazer® Pro 350



OWNER'S MANUAL

Visit our website at

www.MillerWelds.com

From Miller to You

Thank you and *congratulations* on choosing Miller. Now you can get the job done and get it done right. We know you don't have time to do it any other way.

That's why when Niels Miller first started building arc welders in 1929, he made sure his products offered long-lasting value and superior quality. Like you, his customers couldn't afford anything less. Miller products had to be more than the best they could be. They had to be the best you could buy.

Today, the people that build and sell Miller products continue the tradition. They're just as committed to providing equipment and service that meets the high standards of quality and value established in 1929.

This Owner's Manual is designed to help you get the most out of your Miller products. Please take time to read the Safety precautions. They will help you protect yourself against potential hazards on the worksite. We've made installation and operation quick and easy. With Miller you can count on years of reliable service with proper maintenance. And if for some reason the unit needs repair, there's a Troubleshooting section that will help you figure out what the problem is. The parts list will then help you to decide the exact part you may need to fix the problem. Warranty and service information for your particular model are also provided.

ISO 9001 REGISTERED QUALITY SYSTEM

Miller is the first welding equipment manufacturer in the U.S.A. to be registered to the ISO 9001 Quality System Standard.

Miller Electric manufactures a full line of welders and welding related equipment. For information on other quality Miller products, contact your local Miller distributor to receive the latest full line catalog orindividual catalog sheets. **To locate your nearest distributor or service agency call 1-800-4-A-Miller, or visit us at www.MillerWelds.com on the web.**

TRUE BLUE® WARRANTY

Working as hard as you do – every power source from Miller is backed by the most hassle-free warranty in the business.

Miller offers a Technical Manual which provides more detailed service and parts information for your unit. To obtain a Technical Manual, contact your local distributor. Your distributor can also supply you with Welding Process Manuals such as SMAW, GTAW, GMAW, and GMAW-P.

Miller® *The Power of Blue.*

⚠ WARNING

This product, when used for welding or cutting, produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code Section 25249.5 et seq.)

⚠ WARNING

Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Wash hands after handling.

CALIFORNIA

Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

The following terms are used interchangeably throughout this manual:
MIG = GMAW, Wire Welding
TIG = GTAW
Stick = SMAW

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SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING

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1-1. Symbol Usage

Means Warning! Watch Out! There are possible hazards with this procedure! The possible hazards are shown in the adjoining symbols.

▲ **Marks a special safety message.**

☞ *Means "Note"; not safety related.*

This group of symbols means Warning! Watch Out! possible ELECTRIC SHOCK, MOVING PARTS, and HOT PARTS hazards. Consult symbols and related instructions below for necessary actions to avoid the hazards.

1-2. Arc Welding Hazards

▲ **The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Safety Standards listed in Section 1-5. Read and follow all Safety Standards.**

▲ **Only qualified persons should install, operate, maintain, and repair this unit.**

▲ **During operation, keep everybody, especially children, away.**

ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

- Do not touch live electrical parts.
- Wear dry, hole-free insulating gloves and body protection.
- Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- Do not use AC output in damp areas, if movement is confined, or if there is a danger of falling.
- Use AC output ONLY if required for the welding process.
- If AC output is required, use remote output control if present on unit.
- Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
- Always verify the supply ground – check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- When making input connections, attach proper grounding conductor first – double-check connections.
- Frequently inspect input power cord for damage or bare wiring – replace cord immediately if damaged – bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized, or poorly spliced cables.
- Do not drape cables over your body.
- If earth grounding of the workpiece is required, ground it directly with a separate cable.
- Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
- Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
- Wear a safety harness if working above floor level.
- Keep all panels and covers securely in place.
- Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.
- Insulate work clamp when not connected to workpiece to prevent contact with any metal object.
- Do not connect more than one electrode or work cable to any single weld output terminal.

SIGNIFICANT DC VOLTAGE exists in inverters after stopping engine.

- Stop engine on inverter and discharge input capacitors according to instructions in Maintenance Section before touching any parts.

ARC RAYS can burn eyes and skin.

Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

- Wear a welding helmet fitted with a proper shade of filter to protect your face and eyes from arc rays and sparks when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
- Wear approved safety glasses with side shields under your helmet.
- Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
- Wear protective clothing made from durable, flame-resistant material (wool and leather) and foot protection.

FUMES AND GASES can be hazardous.

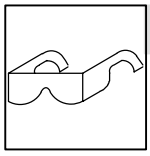
Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

- Keep your head out of the fumes. Do not breathe the fumes.
- If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
- If ventilation is poor, use an approved air-supplied respirator.
- Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for metals, consumables, coatings, cleaners, and degreasers.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watch-person nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
- Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and if necessary, while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

WELDING can cause fire or explosion.

Welding on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

- Protect yourself and others from flying sparks and hot metal.
- Do not weld where flying sparks can strike flammable material.
- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.
- Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
- Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to AWS F4.1 (see Safety Standards).
- Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock and fire hazards.
- Do not use welder to thaw frozen pipes.
- Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
- Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
- Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.



FLYING METAL can injure eyes.

- Welding, chipping, wire brushing, and grinding cause sparks and flying metal. As welds cool, they can throw off slag.
- Wear approved safety glasses with side shields even under your welding helmet.

BUILDUP OF GAS can injure or kill.

- Shut off shielding gas supply when not in use.
- Always ventilate confined spaces or use approved air-supplied respirator.

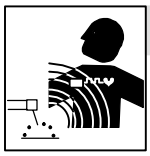
HOT PARTS can cause severe burns.

- Allow cooling period before maintaining.
- Wear protective gloves and clothing when working on a hot engine.
- Do not touch hot engine parts or just-welded parts bare-handed.

NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.



MAGNETIC FIELDS can affect pacemakers.

- Pacemaker wearers keep away.
- Wearers should consult their doctor before going near arc welding, gouging, or spot welding operations.

CYLINDERS can explode if damaged.

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

- Protect compressed gas cylinders from excessive heat, mechanical shocks, slag, open flames, sparks, and arcs.
- Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.
- Keep cylinders away from any welding or other electrical circuits.
- Never drape a welding torch over a gas cylinder.
- Never allow a welding electrode to touch any cylinder.
- Never weld on a pressurized cylinder – explosion will result.
- Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
- Turn face away from valve outlet when opening cylinder valve.
- Keep protective cap in place over valve except when cylinder is in use or connected for use.
- Read and follow instructions on compressed gas cylinders, associated equipment, and CGA publication P-1 listed in Safety Standards.

1-3. Engine Hazards

FUEL can cause fire or explosion.

- Stop engine and let it cool off before checking or adding fuel.
- Do not add fuel while smoking or if unit is near any sparks or open flames.
- Do not overfill tank – allow room for fuel to expand.
- Do not spill fuel. If fuel is spilled, clean up before starting engine.
- Dispose of rags in a fireproof container.

STEAM AND HOT COOLANT can burn.

- If possible, check coolant level when engine is cold to avoid scalding.
- Always check coolant level at overflow tank, if present on unit, instead of radiator (unless told otherwise in maintenance section or engine manual).
- If the engine is warm, checking is needed, and there is no overflow tank, follow the next two statements.
- Wear safety glasses and gloves and put a rag over radiator cap.
- Turn cap slightly and let pressure escape slowly before completely removing cap.

MOVING PARTS can cause injury.

- Keep away from fans, belts, and rotors.
- Keep all doors, panels, covers, and guards closed and securely in place.
- Stop engine before installing or connecting unit.
- Have only qualified people remove guards or covers for maintenance and troubleshooting as necessary.
- To prevent accidental starting during servicing, disconnect negative (–) battery cable from battery.
- Keep hands, hair, loose clothing, and tools away from moving parts.
- Reinstall panels or guards and close doors when servicing is finished and before starting engine.
- Before working on generator, remove spark plugs or injectors to keep engine from kicking back or starting.
- Block flywheel so that it will not turn while working on generator components.

BATTERY EXPLOSION can BLIND.

- Always wear a face shield, rubber gloves, and protective clothing when working on a battery.
- Stop engine before disconnecting or connecting battery cables or servicing battery.
- Do not allow tools to cause sparks when working on a battery.
- Do not use welder to charge batteries or jump start vehicles.
- Observe correct polarity (+ and –) on batteries.
- Disconnect negative (–) cable first and connect it last.

BATTERY ACID can BURN SKIN and EYES.

- Do not tip battery.
- Replace damaged battery.
- Flush eyes and skin immediately with water.

ENGINE EXHAUST GASES can kill.

- Use equipment outside in open, well-ventilated areas.
- If used in a closed area, vent engine exhaust outside and away from any building air intakes.

ENGINE HEAT can cause fire.

- Do not locate unit on, over, or near combustible surfaces or flammables.
- Keep exhaust and exhaust pipes way from flammables.

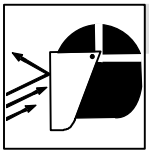
EXHAUST SPARKS can cause fire.

- Do not let engine exhaust sparks cause fire.
- Use approved engine exhaust spark arrestor in required areas – see applicable codes.

1-4. Additional Symbols For Installation, Operation, And Maintenance

FALLING UNIT can cause injury.

- Use lifting eye to lift unit only, NOT running gear, gas cylinders, trailer, or any other accessories.
- Use equipment of adequate capacity to lift and support unit.
- If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.

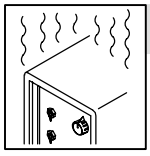


FLYING SPARKS can cause injury.

- Wear a face shield to protect eyes and face.
- Shape tungsten electrode only on grinder with proper guards in a safe location wearing proper face, hand, and body protection.
- Sparks can cause fires — keep flammables away.

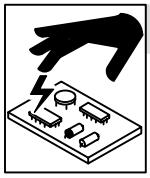
OVERHEATING can damage motors.

- Turn off or unplug equipment before starting or stopping engine.
- Do not let low voltage and frequency caused by low engine speed damage electric motors.
- Do not connect 50 or 60 Hertz motors to the 100 Hertz receptacle where applicable.



OVERUSE can cause OVERHEATING.

- Allow cooling period; follow rated duty cycle.
- Reduce current or reduce duty cycle before starting to weld again.
- Do not block or filter airflow to unit.

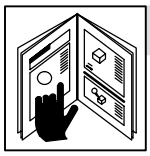


STATIC (ESD) can damage PC boards.

- Put on grounded wrist strap BEFORE handling boards or parts.
- Use proper static-proof bags and boxes to store, move, or ship PC boards.

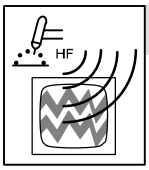
TILTING OF TRAILER can cause injury.

- Use tongue jack or blocks to support weight.
- Properly install welding generator onto trailer according to instructions supplied with trailer.



READ INSTRUCTIONS.

- Use only genuine MILLER replacement parts.
- Perform engine maintenance and service according to this manual and the engine manual.



H.F. RADIATION can cause interference.

- High-frequency (H.F.) can interfere with radio navigation, safety services, computers, and communications equipment.
- Have only qualified persons familiar with electronic equipment perform this installation.
- The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.
- If notified by the FCC about interference, stop using the equipment at once.
- Have the installation regularly checked and maintained.
- Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.

ARC WELDING can cause interference.

- Electromagnetic energy can interfere with sensitive electronic equipment such as computers and computer-driven equipment such as robots.
- Be sure all equipment in the welding area is electromagnetically compatible.
- To reduce possible interference, keep weld cables as short as possible, close together, and down low, such as on the floor.
- Locate welding operation 100 meters from any sensitive electronic equipment.
- Be sure this welding machine is installed and grounded according to this manual.
- If interference still occurs, the user must take extra measures such as moving the welding machine, using shielded cables, using line filters, or shielding the work area.

1-5. Principal Safety Standards

Safety in Welding and Cutting, ANSI Standard Z49.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami FL 33126

Safety and Health Standards, OSHA 29 CFR 1910, from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, American Welding Society Standard AWS F4.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

Safe Practices For Occupation And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting And Welding Processes, NFPA Standard 51B, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

1-6. EMF Information

Considerations About Welding And The Effects Of Low Frequency Electric And Magnetic Fields

Welding current, as it flows through welding cables, will cause electromagnetic fields. There has been and still is some concern about such fields. However, after examining more than 500 studies spanning 17 years of research, a special blue ribbon committee of the National Research Council concluded that: “The body of evidence, in the committee’s judgment, has not demonstrated that exposure to power-frequency electric and magnetic fields is a human-health hazard.” However, studies are still going forth and evidence continues to be examined. Until the final conclusions of the research are reached, you may wish to minimize your exposure to electromagnetic fields when welding or cutting.

To reduce magnetic fields in the workplace, use the following procedures:

1. Keep cables close together by twisting or taping them.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.
4. Keep welding power source and cables as far away from operator as practical.
5. Connect work clamp to workpiece as close to the weld as possible.

About Pacemakers:

Pacemaker wearers consult your doctor first. If cleared by your doctor, then following the above procedures is recommended.

SECTION 1 – CONSIGNES DE SÉCURITÉ – LIRE AVANT UTILISATION

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1-1. Signification des symboles

Signifie Mise en garde ! Soyez vigilant ! Cette procédure présente des risques de danger ! Ceux-ci sont identifiés par des symboles adjacents aux directives.

▲ **Identifie un message de sécurité particulier.**

☞ *Signifie NOTA ; n'est pas relatif à la sécurité.*

Ce groupe de symboles signifie Mise en garde ! Soyez vigilant ! Il y a des risques de danger reliés aux CHOCS ÉLECTRIQUES, aux PIÈCES EN MOUVEMENT et aux PIÈCES CHAUDES. Reportez-vous aux symboles et aux directives ci-dessous afin de connaître les mesures à prendre pour éviter tout danger.

1-2. Dangers relatifs au soudage à l'arc

▲ **Les symboles présentés ci-après sont utilisés tout au long du présent manuel pour attirer votre attention et identifier les risques de danger. Lorsque vous voyez un symbole, soyez vigilant et suivez les directives mentionnées afin d'éviter tout danger. Les consignes de sécurité présentées ci-après ne font que résumer l'information contenue dans les normes de sécurité énumérées à la section 1-5. Veuillez lire et respecter toutes ces normes de sécurité.**

▲ **L'installation, l'utilisation, l'entretien et les réparations ne doivent être confiés qu'à des personnes qualifiées.**

▲ **Au cours de l'utilisation, tenir toute personne à l'écart et plus particulièrement les enfants.**

UN CHOC ÉLECTRIQUE peut tuer.

Un simple contact avec des pièces électriques peut provoquer une électrocution ou des blessures graves. L'électrode et le circuit de soudage sont sous tension dès que l'appareil est sur ON. Le circuit d'entrée et les circuits internes de l'appareil sont également sous tension à ce moment-là. En soudage semi-automatique ou automatique, le fil, le dévidoir, le logement des galets d'entraînement et les pièces métalliques en contact avec le fil de soudage sont sous tension. Des matériels mal installés ou mal mis à la terre présentent un danger.

- Ne jamais toucher les pièces électriques sous tension.
- Porter des gants et des vêtements de protection secs ne comportant pas de trous.
- S'isoler de la pièce et de la terre au moyen de tapis ou d'autres moyens isolants suffisamment grands pour empêcher le contact physique éventuel avec la pièce ou la terre.
- Ne pas se servir de source électrique àcourant électrique dans les zones humides, dans les endroits confinés ou là où on risque de tomber.
- Se servir d'une source électrique àcourant électrique UNIQUEMENT si le procédé de soudage le demande.
- Si l'utilisation d'une source électrique àcourant électrique s'avère nécessaire, se servir de la fonction de télécommande si l'appareil en est équipé.
- Couper l'alimentation ou arrêter le moteur avant de procéder à l'installation, à la réparation ou à l'entretien de l'appareil. Déverrouiller l'alimentation selon la norme OSHA 29 CFR 1910.147 (voir normes de sécurité).
- Installer et mettre à la terre correctement cet appareil conformément à son manuel d'utilisation et aux codes nationaux, provinciaux et municipaux.
- Toujours vérifier la terre du cordon d'alimentation – Vérifier et s'assurer que le fil de terre du cordon d'alimentation est bien raccordé à la borne de terre du sectionneur ou que la fiche du cordon est raccordée à une prise correctement mise à la terre.
- En effectuant les raccordements d'entrée fixer d'abord le conducteur de mise à la terre approprié et contre-vérifier les connexions.
- Vérifier fréquemment le cordon d'alimentation pour voir s'il n'est pas endommagé ou dénudé – remplacer le cordon immédiatement s'il est endommagé – un câble dénudé peut provoquer une électrocution.
- Mettre l'appareil hors tension quand on ne l'utilise pas.
- Ne pas utiliser des câbles usés, endommagés, de grosseur insuffisante ou mal épissés.
- Ne pas enrouler les câbles autour du corps.
- Si la pièce soudée doit être mise à la terre, le faire directement avec un câble distinct – ne pas utiliser le connecteur de pièce ou le câble de retour.
- Ne pas toucher l'électrode quand on est en contact avec la pièce, la terre ou une électrode provenant d'une autre machine.
- N'utiliser qu'un matériel en bon état. Réparer ou remplacer sur-le-champ les pièces endommagées. Entretenir l'appareil conformément à ce manuel.
- Porter un harnais de sécurité quand on travaille en hauteur.
- Maintenir solidement en place tous les panneaux et capots.
- Fixer le câble de retour de façon à obtenir un bon contact métal-métal avec la pièce à souder ou la table de travail, le plus près possible de la soudure.
- Isoler la pince de masse quand pas mis à la pièce pour éviter le contact avec tout objet métallique.

Une tension DC importante subsiste à l'intérieur des onduleurs après avoir coupé l'alimentation.

- Couper l'alimentation du poste et décharger les condensateurs d'entrée comme indiqué dans la Section Maintenance avant de toucher des composants.

LES RAYONS DE L'ARC peuvent provoquer des brûlures dans les yeux et sur la peau.

Le rayonnement de l'arc du procédé de soudage génère des rayons visibles et invisibles intenses (ultraviolets et infrarouges) susceptibles de provoquer des brûlures dans les yeux et sur la peau. Des étincelles sont projetées pendant le soudage.

- Porter un casque de soudage muni d'un écran de filtre approprié pour protéger votre visage et vos yeux pendant le soudage ou pour regarder (voir ANSI Z49.1 et Z87.1 énuméré dans les normes de sécurité).
- Porter des protections approuvés pour les oreilles si le niveau sondre est trop élevé.
- Utiliser des écrans ou des barrières pour protéger des tiers de l'éclair et de l'éblouissement; demander aux autres personnes de ne pas regarder l'arc.
- Porter des vêtements de protection constitué dans une matière durable, résistant au feu (laine ou cuir) et une protection des pieds.

LES FUMÉES ET LES GAZ peuvent être dangereux.

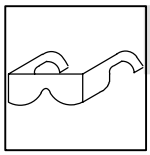
Le soudage génère des fumées et des gaz. Leur inhalation peut être dangereux pour votre santé.

- Eloigner votre tête des fumées. Ne pas respirer les fumées.
- À l'interieur, ventiler la zone et/ou utiliser un échappement au niveau de l'arc pour l'évacuation des fumées et des gaz de soudage.
- Si la ventilation est insuffisante, utiliser un respirateur à alimentation d'air homologué.
- Lire les spécifications de sécurité des matériaux (MSDSs) et les instructions du fabricant concernant les métaux, les consommables, les revêtements, les nettoyants et les dégraisseurs.
- Travailler dans un espace fermé seulement s'il est bien ventilé ou en portant un respirateur à alimentation d'air. Demander toujours à un surveillant dûment formé de se tenir à proximité. Des fumées et des gaz de soudage peuvent déplacer l'air et abaisser le niveau d'oxygène provoquant des blessures ou des accidents mortels. S'assurer que l'air de respiration ne présente aucun danger.
- Ne pas souder dans des endroits situés à proximité d'opérations de dégraissage, de nettoyage ou de pulvérisation. La chaleur et les rayons de l'arc peuvent réagir en présence de vapeurs et former des gaz hautement toxiques et irritants.
- Ne pas souder des métaux munis d'un revêtement, tels que l'acier galvanisé, plaqué en plomb ou au cadmium à moins que le revêtement n'ait été enlevé dans la zone de soudure, que l'endroit soit bien ventilé, et si nécessaire, en portant un respirateur à alimentation d'air. Les revêtements et tous les métaux renfermant ces éléments peuvent dégager des fumées toxiques en cas de soudage.

LE SOUDAGE peut provoquer un incendie ou une explosion.

Le soudage effectué sur des conteneurs fermés tels que des réservoirs, tambours ou des conduites peut provoquer leur éclatement. Des étincelles peuvent être projetées de l'arc de soudure. La projection d'étincelles, des pièces chaudes et des équipements chauds peut provoquer des incendies et des brûlures. Le contact accidentel de l'électrode avec des objets métalliques peut provoquer des étincelles, une explosion, un surchauffement ou un incendie. Avant de commencer le soudage, vérifier et s'assurer que l'endroit ne présente pas de danger.

- Se protéger et d'autres personnes de la projection d'étincelles et de métal chaud.
- Ne pas souder dans un endroit là où des étincelles peuvent tomber sur des substances inflammables.
- Déplacer toutes les substances inflammables à une distance de 10,7 m de l'arc de soudage. En cas d'impossibilité les recouvrir soigneusement avec des protections homologués.
- Des étincelles et des matériaux chauds du soudage peuvent facilement passer dans d'autres zones en traversant de petites fissures et des ouvertures.
- Surveiller tout déclenchement d'incendie et tenir un extincteur à proximité.
- Le soudage effectué sur un plafond, plancher, paroi ou séparation peut déclencher un incendie de l'autre côté.
- Ne pas effectuer le soudage sur des conteneurs fermés tels que des réservoirs, tambours, ou conduites, à moins qu'ils n'aient été préparés correctement conformément à AWS F4.1 (voir les normes de sécurité).
- Brancher le câble sur la pièce le plus près possible de la zone de soudage pour éviter le transport du courant sur une longue distance par des chemins inconnus éventuels en provoquant des risques d'électrocution et d'incendie.
- Ne pas utiliser le poste de soudage pour dégeler des conduites gelées.
- En cas de non utilisation, enlever la baguette d'électrode du porte-électrode ou couper le fil à la pointe de contact.
- Porter des vêtements de protection dépourvus d'huile tels que des gants en cuir, une chemise en matériau lourd, des pantalons sans revers, des chaussures hautes et un couvre chef.
- Avant de souder, retirer toute substance combustible de vos poches telles qu'un allumeur au butane ou des allumettes.



DES PARTICULES VOLANTES peuvent blesser les yeux.

- Le soudage, l'écaillement, le passage de la pièce à la brosse en fil de fer, et le meulage génèrent des étincelles et des particules métalliques volantes. Pendant la période de refroidissement des soudures, elles risquent de projeter du laitier.
- Porter des lunettes de sécurité avec écrans latéraux ou un écran facial.

LES ACCUMULATIONS DE GAZ risquent de provoquer des blessures ou même la mort.

- Fermer l'alimentation du gaz protecteur en cas de non utilisation.
- Veiller toujours à bien aérer les espaces confinés ou se servir d'un respirateur d'adduction d'air homologué.

DES PIÈCES CHAUDES peuvent provoquer des brûlures graves.

- Prévoir une période de refroidissement avant d'effectuer des travaux d'entretien.
- Porter des gants et des vêtements de protection pour travailler sur un moteur chaud.
- Ne pas toucher à mains nues les parties chaudes du moteur ni les pièces récemment soudées.

LE BRUIT peut affecter l'ouïe.

Le bruit des processus et des équipements peut affecter l'ouïe.

- Porter des protections approuvés pour les oreilles si le niveau sondre est trop élevé.

LES CHAMPS MAGNÉTIQUES peuvent affecter les stimulateurs cardiaques.

- Porteurs de stimulateur cardiaque, restez à distance.
- Les porteurs d'un stimulateur cardiaque doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de gougeage ou de soudage par points.

Si des BOUTEILLES sont endommagées, elles pourront exploser.

Des bouteilles de gaz protecteur contiennent du gaz sous haute pression. Si une bouteille est endommagée, elle peut exploser. Du fait que les bouteilles de gaz font normalement partie du procédé de soudage, les manipuler avec précaution.

- Protéger les bouteilles de gaz comprimé d'une chaleur excessive, des chocs mécaniques, du laitier, des flammes ouvertes, des étincelles et des arcs.
- Placer les bouteilles debout en les fixant dans un support stationnaire ou dans un porte-bouteilles pour les empêcher de tomber ou de se renverser.
- Tenir les bouteilles éloignées des circuits de soudage ou autres circuits électriques.
- Ne jamais placer une torche de soudage sur une bouteille à gaz.
- Une électrode de soudage ne doit jamais entrer en contact avec une bouteille.
- Ne jamais souder une bouteille pressurisée – risque d'explosion.
- Utiliser seulement des bouteilles de gaz protecteur, régulateurs, tuyaux et raccords convenables pour cette application spécifique; les maintenir ainsi que les éléments associés en bon état.
- Ne pas tenir la tête en face de la sortie en ouvrant la soupape de la bouteille.
- Maintenir le chapeau de protection sur la soupape, sauf en cas d'utilisation ou de branchement de la bouteille.
- Lire et suivre les instructions concernant les bouteilles de gaz comprimé, les équipements associés et les publication P-1 CGA énumérées dans les normes de sécurité.

1-3. Dangers existant en relation avec le moteur

LE CARBURANT MOTEUR peut provoquer un incendie ou une explosion.

- Arrêter le moteur avant de vérifier le niveau de carburant ou de faire le plein.
- Ne pas faire le plein en fumant ou proche d'une source d'étincelles ou d'une flamme nue.
- Ne pas faire le plein de carburant à ras bord; prévoir de l'espace pour son expansion.
- Faire attention de ne pas renverser de carburant. Nettoyer tout carburant renversé avant de faire démarrer le moteur.
- Jeter les chiffons dans un récipient ignifuge.

LA VAPEUR ET LE LIQUIDE DE REFROIDISSEMENT CHAUD peuvent provoquer des brûlures.

- Il est préférable de vérifier le liquide de refroidissement une fois le moteur refroidi pour éviter de se brûler.
- Toujours vérifier le niveau de liquide de refroidissement dans le vase d'expansion (si présent), et non dans le radiateur (sauf si précisé autrement dans la section maintenance du manuel du moteur).
- Si le moteur est chaud et que le liquide doit être vérifié, opérer comme suivant :
- Mettre des lunettes de sécurité et des gants, placer un torchon sur le bouchon du radiateur.
- Dévisser le bouchon légèrement et laisser la vapeur s'échapper avant d'enlever le bouchon.

DES ORGANES MOBILES peuvent provoquer des blessures.

- Ne pas approcher les mains des ventilateurs, courroies et autres pièces en mouvement.
- Maintenir fermés et fixement en place les portes, panneaux, recouvrements et dispositifs de protection.
- Arrêter le moteur avant d'installer ou brancher l'appareil.
- Demander seulement à un personnel qualifié d'enlever les dispositifs de sécurité ou les recouvrements pour effectuer, s'il y a lieu, des travaux d'entretien et de dépannage.
- Pour empêcher tout démarrage accidentel pendant les travaux d'entretien, débrancher le câble négatif (–) de batterie de la borne.
- Ne pas approcher les mains, cheveux, vêtements lâches et outils des organes mobiles.
- Remettre en place les panneaux ou les dipositifs de protection et fermer les portes à la fin des travaux d'entretien et avant de faire démarrer le moteur.
- Avant d'intervenir, déposer les bougies ou injecteurs pour éviter la mise en route accidentelle du moteur.
- Bloquer le volant moteur pour éviter sa rotation lors d'une intervention sur le générateur.

L'EXPLOSION DE LA BATTERIE peut RENDRE AVEUGLE.

- Toujours porter une protection faciale, des gants en caoutchouc et vêtements de protection lors d'une intervention sur la batterie.
- Arrêter le moteur avant de débrancher ou de brancher les câbles de batterie.
- Eviter de provoquer des étincelles avec les outils en travaillant sur la batterie.
- Ne pas utiliser le poste de soudage pour charger les batteries ou des véhicules de démarrage rapide.
- Observer la polarité correcte (+ et –) sur les batteries.
- Débrancher le câble négatif (–) en premier lieu. Le rebrancher en dernier lieu.

L'ACIDE DE LA BATTERIE peut provoquer des brûlures dans les YEUX et sur la PEAU.

- Ne pas renverser la batterie.
- Remplacer une batterie endommagée.
- Rincer immédiatement les yeux et la peau à l'eau.

LES GAZ D'ÈCHAPPEMENT DU MOTEUR peuvent provoquer des accidents mortels.

- Utiliser l'équipement à l'extérieur dans des zones ouvertes et bien ventilées.
- En cas d'utilisation dans un endroit fermé évacuer les gaz d'échappement du moteur vers l'extérieur à distance des entrées d'air dans les bâtiments.

LA CHALEUR DU MOTEUR peut provoquer un incendie.

- Ne pas placer l'appareil sur, au-dessus ou à proximité de surfaces inflammables.
- Tenir à distance les produits inflammables de l'échappement.

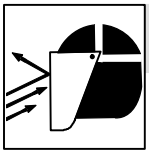
LES ÉTINCELLES À L'ÉCHAPPEMENT peuvent provoquer un incendie.

- Empêcher les étincelles d'échappement du moteur de provoquer un incendie.
- Utiliser uniquement un pare-étincelles approuvé – voir codes en vigueur.

1-4. Dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance

LA CHUTE DE L'APPAREIL peut blesser.

- Utiliser l'anneau de levage uniquement pour soulever l'appareil lui-même ; sans chariot, de bouteilles de gaz, remorque, ou autres accessoires.
- Utiliser un équipement de levage de capacité suffisante pour lever l'appareil.
- En utilisant des fourches de levage pour déplacer l'unité, s'assurer que les fourches sont suffisamment longues pour dépasser du côté opposé de l'appareil.

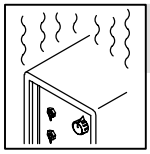


LES ÉTINCELLES VOLANTES risquent de provoquer des blessures.

- Porter un écran facial pour protéger le visage et les yeux.
- Affuterr l'électrode au tungstène uniquement à la meuleuse dotée de protecteurs. Cette manoeuvre est à exécuter dans un endroit sûr lorsque l'on porte l'équipement homologué de protection du visage, des mains et du corps.
- Les étincelles risquent de causer un incendie – éloigner toute substance inflammable.

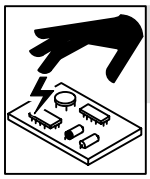
LE SURCHAUFFEMENT peut endommager le moteur électrique.

- Arrêter ou déconnecter l'équipement avant de démarrer ou d'arrêter le moteur.
- Ne pas laisser tourner le moteur trop lentement sous risque d'endommager le moteur électrique à cause d'une tension et d'une fréquence trop faibles.
- Ne pas brancher de moteur de 50 ou de 60 Hz à la prise de 100 Hz, s'il y a lieu.



L'EMPLOI EXCESSIF peut SURCHAUFFER L'ÉQUIPEMENT.

- Laisser l'équipement refroidir ; respecter le facteur de marche nominal.
- Réduire le courant ou le facteur de marche avant de poursuivre le soudage.
- Ne pas obstruer les passages d'air du poste.

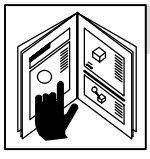


LES CHARGES ÉLECTROSTATIQUES peuvent endommager les circuits imprimés.

- Établir la connexion avec la barrette de terre avant de manipuler des cartes ou des pièces.
- Utiliser des pochettes et des boîtes antistatiques pour stocker, déplacer ou expédier des cartes de circuits imprimes.

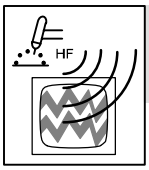
UNE REMORQUE QUI BASCULE peut entraîner des blessures.

- Utiliser les supports de la remorque ou des blocs pour soutenir le poids.
- Installer convenablement le poste sur la remorque comme indiqué dans le manuel s'y rapportant.



LIRE LES INSTRUCTIONS.

- Utiliser seulement les pièces de rechange d'origine.
- Effecteur la maintenance et la mise en service d'après le manuel et celui du moteur.



LE RAYONNEMENT HAUTE FRÉQUENCE (H.F.) risque de provoquer des interférences.

- Le rayonnement haute fréquence (H.F.) peut provoquer des interférences avec les équipements de radio–navigation et de communication, les services de sécurité et les ordinateurs.
- Demander seulement à des personnes qualifiées familiarisées avec des équipements électroniques de faire fonctionner l'installation.
- L'utilisateur est tenu de faire corriger rapidement par un électricien qualifié les interférences résultant de l'installation.
- Si le FCC signale des interférences, arrêter immédiatement l'appareil.
- Effectuer régulièrement le contrôle et l'entretien de l'installation.
- Maintenir soigneusement fermés les portes et les panneaux des sources de haute fréquence, maintenir les éclateurs à une distance correcte et utiliser une terre et et un blindage pour réduire les interférences éventuelles.

LE SOUDAGE À L'ARC risque de provoquer des interférences.

- L'énergie électromagnétique risque de provoquer des interférences pour l'équipement électronique sensible tel que les ordinateurs et l'équipement commandé par ordinateur tel que les robots.
- Veiller à ce que tout l'équipement de la zone de soudage soit compatible électromagnétiquement.
- Pour réduire la possibilité d'interférence, maintenir les câbles de soudage aussi courts que possible, les grouper, et les poser aussi bas que possible (ex. par terre).
- Veiller à souder à une distance de 100 mètres de tout équipement électronique sensible.
- Veiller à ce que ce poste de soudage soit posé et mis à la terre conformément à ce mode d'emploi.
- En cas d'interférences après avoir pris les mesures précédentes, il incombe à l'utilisateur de prendre des mesures supplémentaires telles que le déplacement du poste, l'utilisation de câbles blindés, l'utilisation de filtres de ligne ou la pose de protecteurs dans la zone de travail.

1-5. Principales normes de sécurité

Safety in Welding and Cutting, norme ANSI Z49.1, de l'American Welding Society, 550 N.W. Lejeune Rd, Miami FL 33126

Safety and Health Sandards, OSHA 29 CFR 1910, du Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practice for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, norme AWS F4.1, de l'American Welding Society, 550 N.W. Lejeune Rd, Miami FL 33126

National Electrical Code, NFPA Standard 70, de la National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, de la Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Règles de sécurité en soudage, coupage et procédés connexes, norme CSA W117.2, de l'Association canadienne de normalisation, vente de normes, 178 Rexdale Boulevard, Rexdale (Ontario) Canada M9W 1R3.

Safe Practices For Occupation And Educational Eye And Face Protection, norme ANSI Z87.1, de l'American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting and Welding Processes, norme NFPA 51B, de la National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

1-6. Information sur les champs électromagnétiques

Données sur le soudage électrique et sur les effets, pour l'organisme, des champs magnétiques basse fréquence

Le courant de soudage, pendant son passage dans les câbles de soudage, causera des champs électromagnétiques. Il y a eu et il y a encore un certain souci à propos de tels champs. Cependant, après avoir examiné plus de 500 études qui ont été faites pendant une période de recherche de 17 ans, un comité spécial ruban bleu du National Research Council a conclu: "L'accumulation de preuves, suivant le jugement du comité, n'a pas démontré que l'exposition aux champs magnétiques et champs électriques à haute fréquence représente un risque à la santé humaine". Toutefois, des études sont toujours en cours et les preuves continuent à être examinées. En attendant que les conclusions finales de la recherche soient établies, il vous serait souhaitable de réduire votre exposition aux champs électromagnétiques pendant le soudage ou le coupage.

Afin de réduire les champs électromagnétiques dans l'environnement de travail, respecter les consignes suivantes :

1 Garder les câbles ensembles en les torsadant ou en les attachant avec du ruban adhésif.

2 Mettre tous les câbles du côté opposé de l'opérateur.

3 Ne pas courber pas et ne pas entourer pas les câbles autour de votre corps.

4 Garder le poste de soudage et les câbles le plus loin possible de vous.

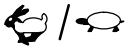
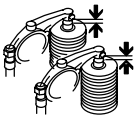
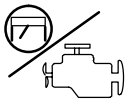
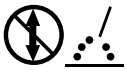
5 Relier la pince de masse le plus près possible de la zone de soudure.

Consignes relatives aux stimulateurs cardiaques :

Les personnes qui portent un stimulateur cardiaque doivent avant tout consulter leur docteur. Si vous êtes déclaré apte par votre docteur, il est alors recommandé de respecter les consignes ci–dessus.

SECTION 2 – DEFINITIONS

2-1. Symbol Definitions

Stop Engine	Fast (Run, Weld/Power)	 Fast/Slow (Run/Idle)	Slow (Idle)
Start Engine	Panel/Local	Temperature	Fuel
Engine Oil	High Temperature	 Check Valve Clearance	Battery (Engine)
 Engine	Glow Plug	**A** Amperes	**V** Volts
MIG (GMAW), Wire	Stick (SMAW)	TIG (GTAW)	Circuit Breaker
CC Constant Current	**CV** Constant Voltage	Electrode Positive	Electrode Negative
Positive	Negative	Alternating Current (AC)	Output
Time	**h** Hours	**s** Seconds	Protective Earth (Ground)
 Do not switch while welding	**14** Remote 14 Receptacle	Work Connection	Read Operator's Manual

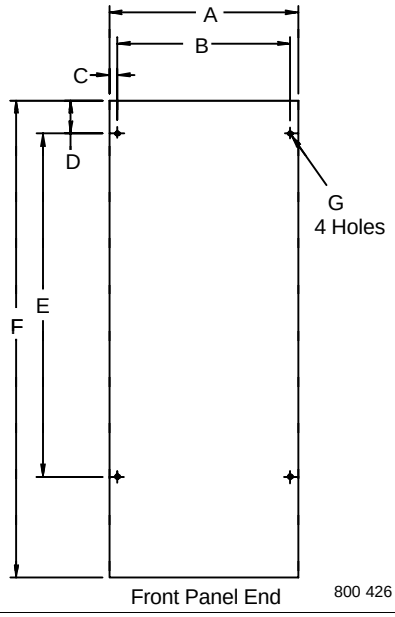
SECTION 3 – SPECIFICATIONS

3-1. Weld, Power, And Engine Specifications

Welding Mode	Rated Welding Output At Weld Speed	Rated Welding Output At Idle Speed	Maximum Open-Circuit Voltage	Amperage Range In CC Mode	Voltage Range In CV Mode	Generator Power Rating	Fuel Capacity	Engine
CC/AC	200 A, 25 V, 60% Duty Cycle	—	75	40 – 225 A	10 – 34 V	**Peak:** 12 kVA/kW **Continuous:** Single-Phase, 10 kVA/kW 50/41.6 A, 120/240 V AC, 60 Hz	13 gal(49 L) Tank	Kubota DH905 Water-Cooled, Three-Cylinder, Four-Cycle, 26 HP Diesel Engine
CC/DC	350 A, 28 V, 60% Duty Cycle	180 A, 28 V, 100% Duty Cycle	80	20 – 350 A				
CV/DC	300 A, 32 V, 100% Duty Cycle	—	50	—				

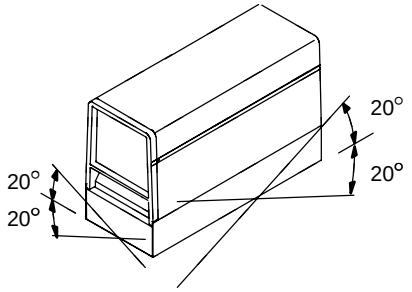
3-2. Dimensions, Weights, and Operating Angles

Dimensions	
Height	36 in (914 mm) (to top of exhaust)
Width	24 in (610 mm)
Depth	59-1/2 in (1511 mm)
A	23-5/8 in (600 mm)
B	21-1/2 in (546 mm)
C	1 in (25 mm)
D	15-5/8 in (397 mm)
E	26-3/8 in (679 mm)
F	58-3/4 in (1492 mm)
G	13/32 in (10 mm) Dia.
Weight	
1030 lb (467 kg)	

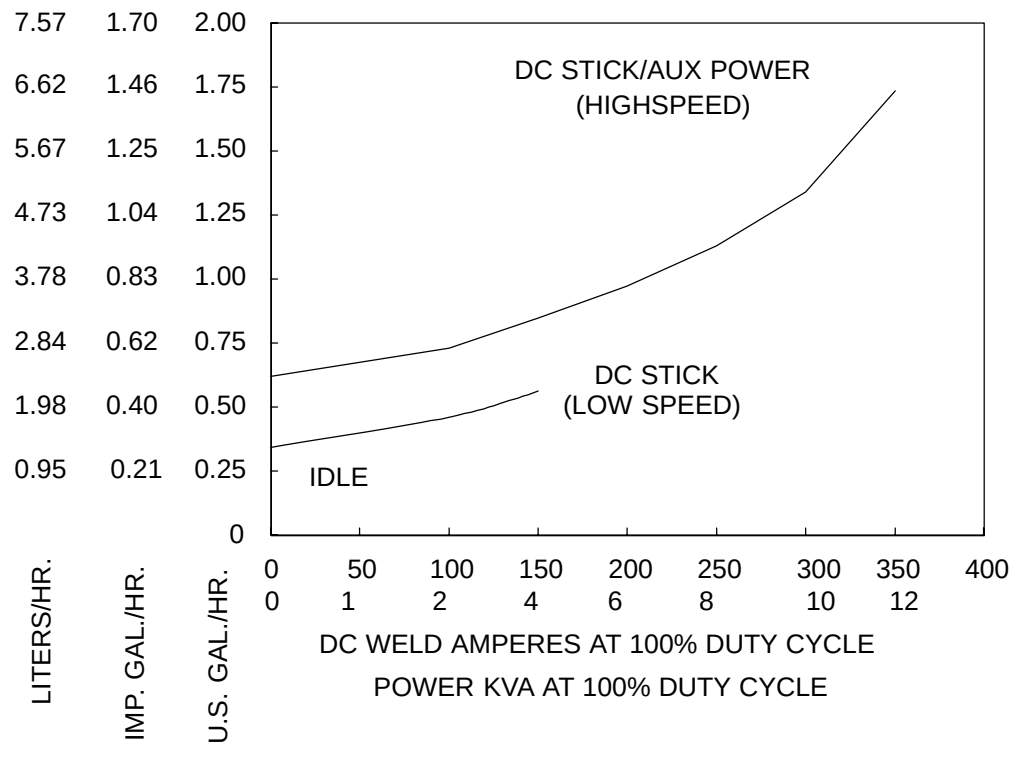


▲ **Do not exceed tilt angles or engine could be damaged or unit could tip.**

▲ **Do not move or operate unit where it could tip.**



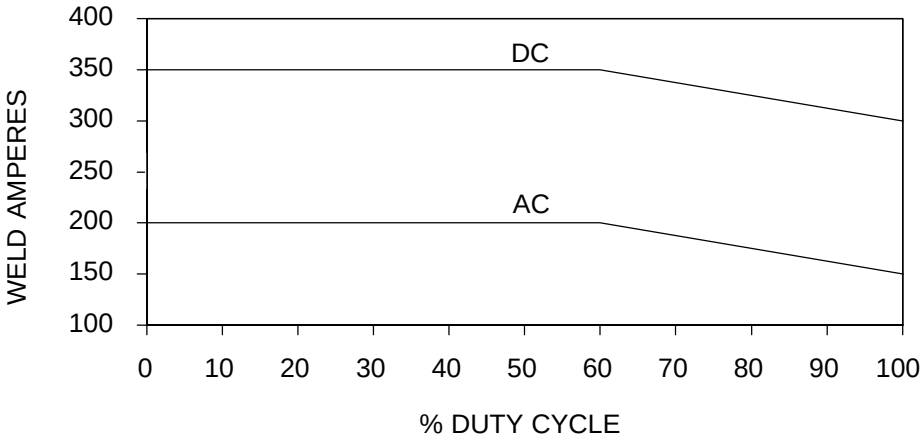
3-3. Fuel Consumption



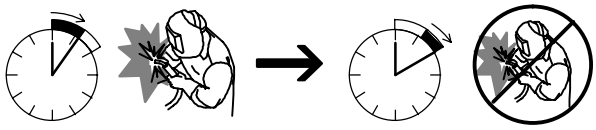
3-4. Duty Cycle And Overheating

Duty Cycle is percentage of 10 minutes that unit can weld at rated load without overheating.

▲ **Exceeding duty cycle can damage unit and void warranty.**



60% Duty Cycle at 350 Amperes DC

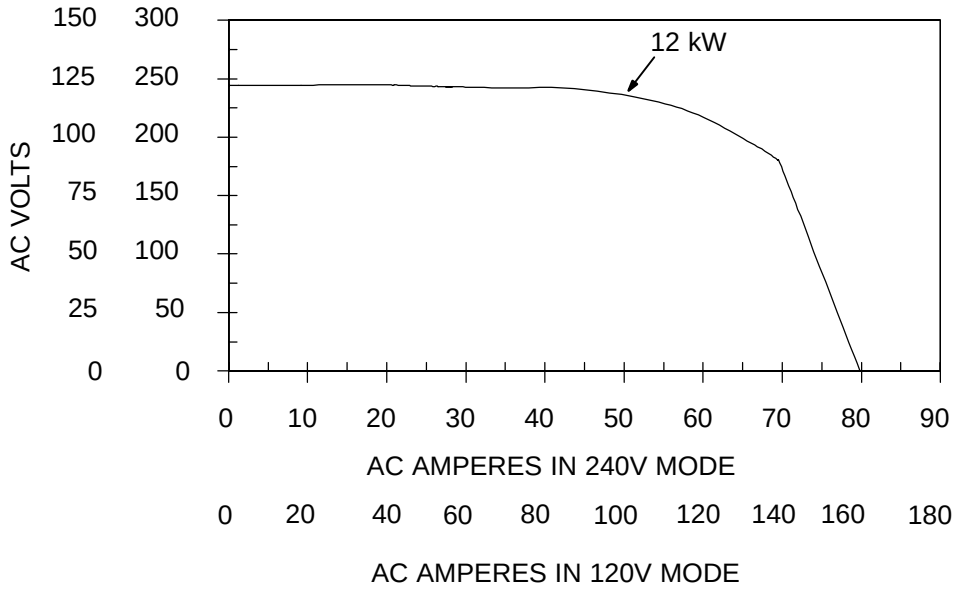


6 Minutes Welding — 4 Minutes Resting

198 919

3-5. AC Generator Power Curve

The ac power curve shows the generator power in amperes available at the 120 and 240 volt receptacles.

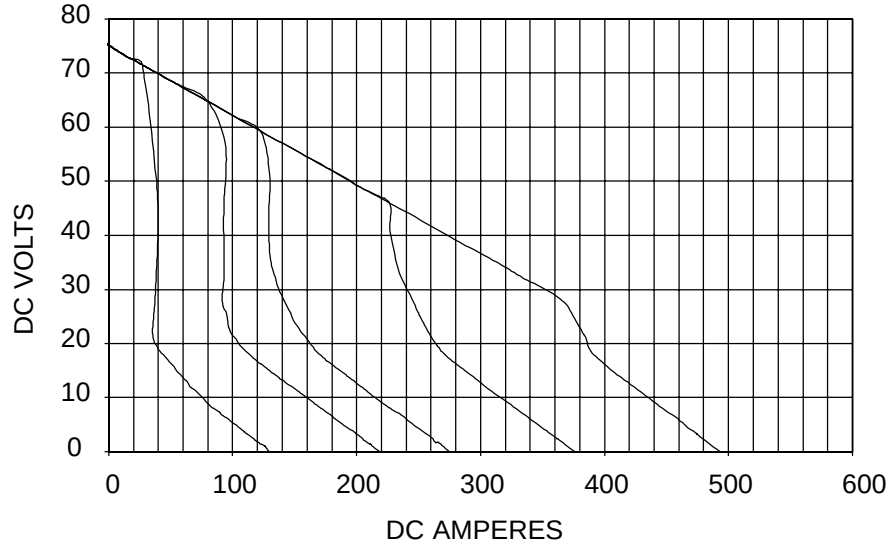


200 268

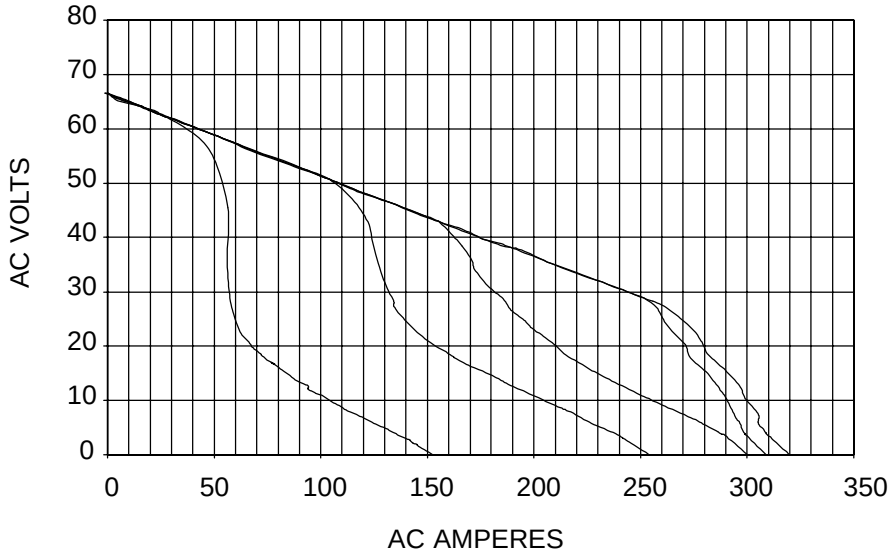
3-6. CC Stick Volt-Ampere Curves

Volt-ampere curves show minimum and maximum voltage and amperage output capabilities of unit. Curves of other settings fall between curves shown.

A. CC/DC Stick Mode



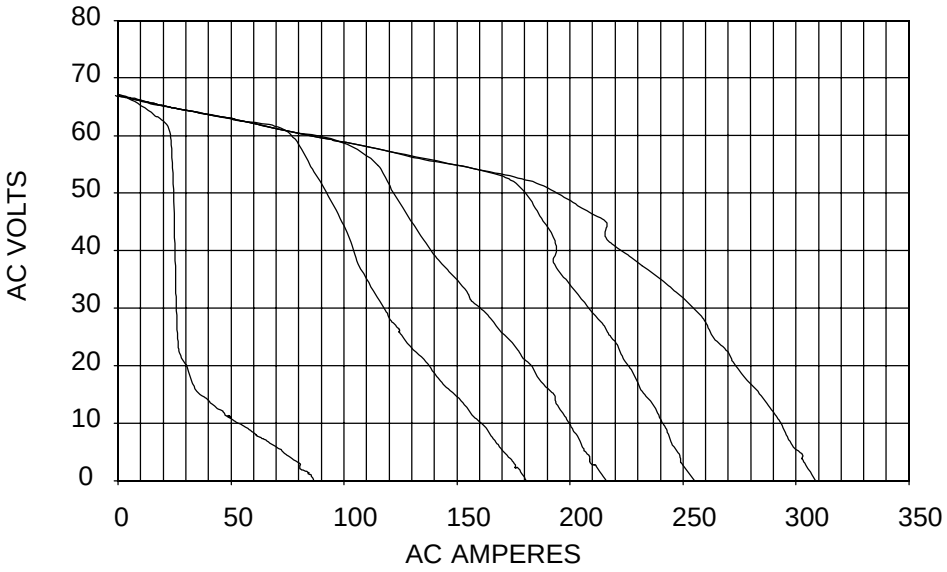
B. CC/AC Stick Mode



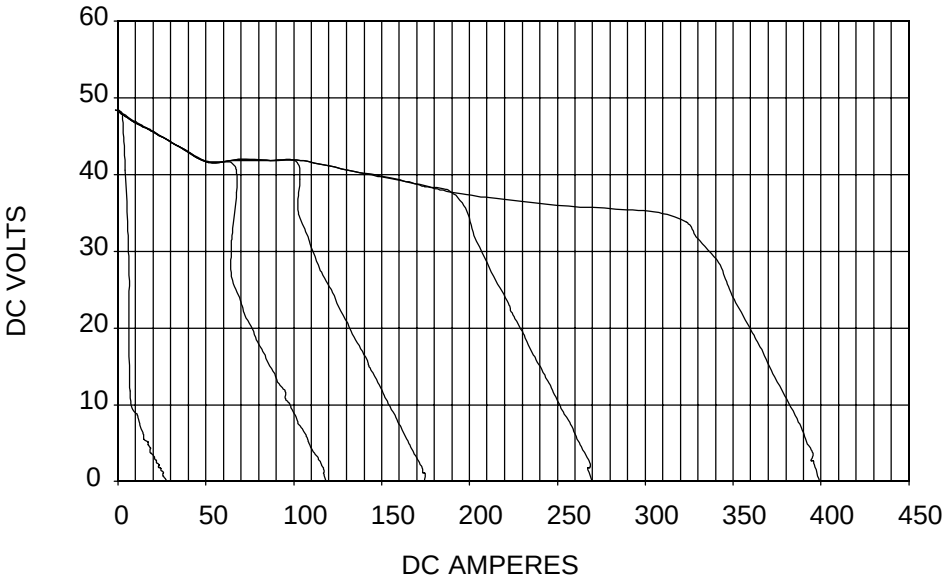
3-7. CC TIG Volt-Ampere Curves

Volt-ampere curves show minimum and maximum voltage and amperage output capabilities of unit. Curves of other settings fall between curves shown.

A. CC/AC TIG Mode

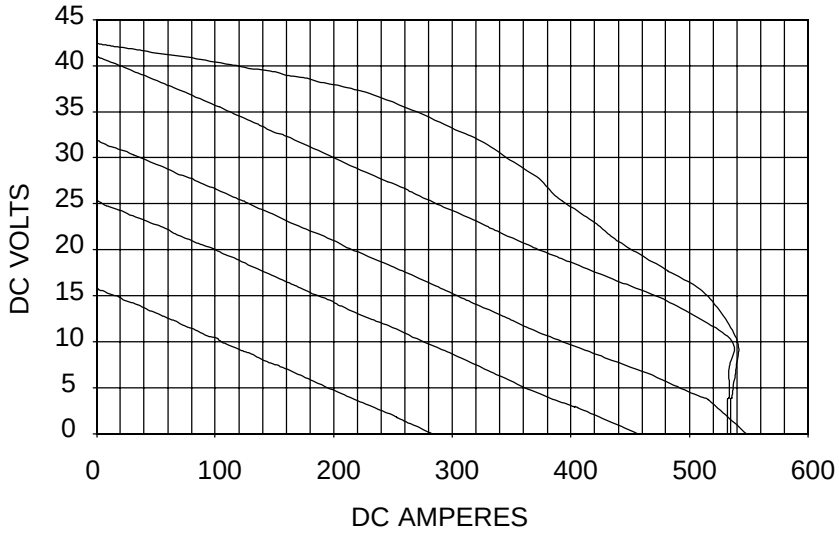


B. CC/DC TIG Mode



3-8. DC/CV MIG Volt-Ampere Curves

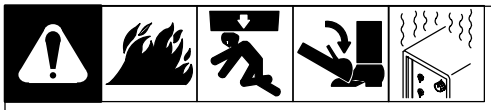
Volt-ampere curves show minimum and maximum voltage and amperage output capabilities of unit. Curves of other settings fall between curves shown.



203 112

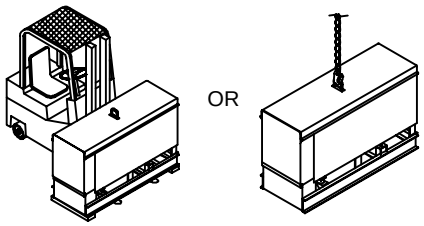
SECTION 4 – INSTALLATION

4-1. Installing Welding Generator

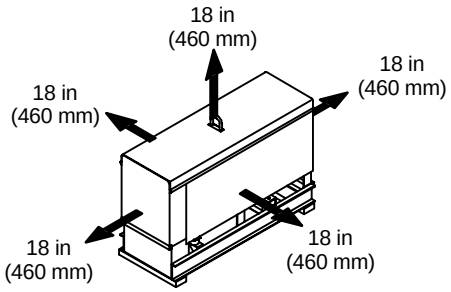


Movement

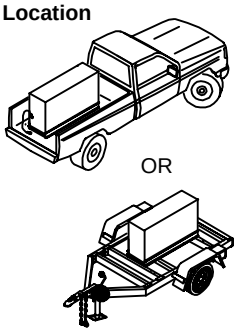
▲ **Do not lift unit from end.**



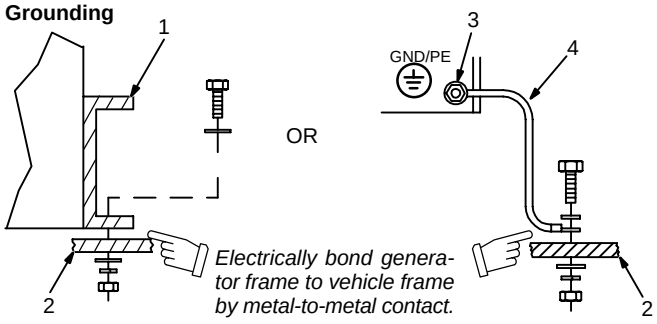
Airflow Clearance



Location



Grounding



Electrically bond generator frame to vehicle frame by metal-to-metal contact.

▲ **Do not weld on base. Welding on base can cause fuel tank fire or explosion. Bolt unit down using holes provided in base.**

▲ **Always securely fasten welding generator onto transport vehicle or trailer and comply with all DOT and other applicable codes.**

▲ **Always ground generator frame to vehicle frame to prevent electric shock and static electricity hazards.**

1 Generator Base

2 Metal Vehicle Frame

3 Equipment Grounding Terminal

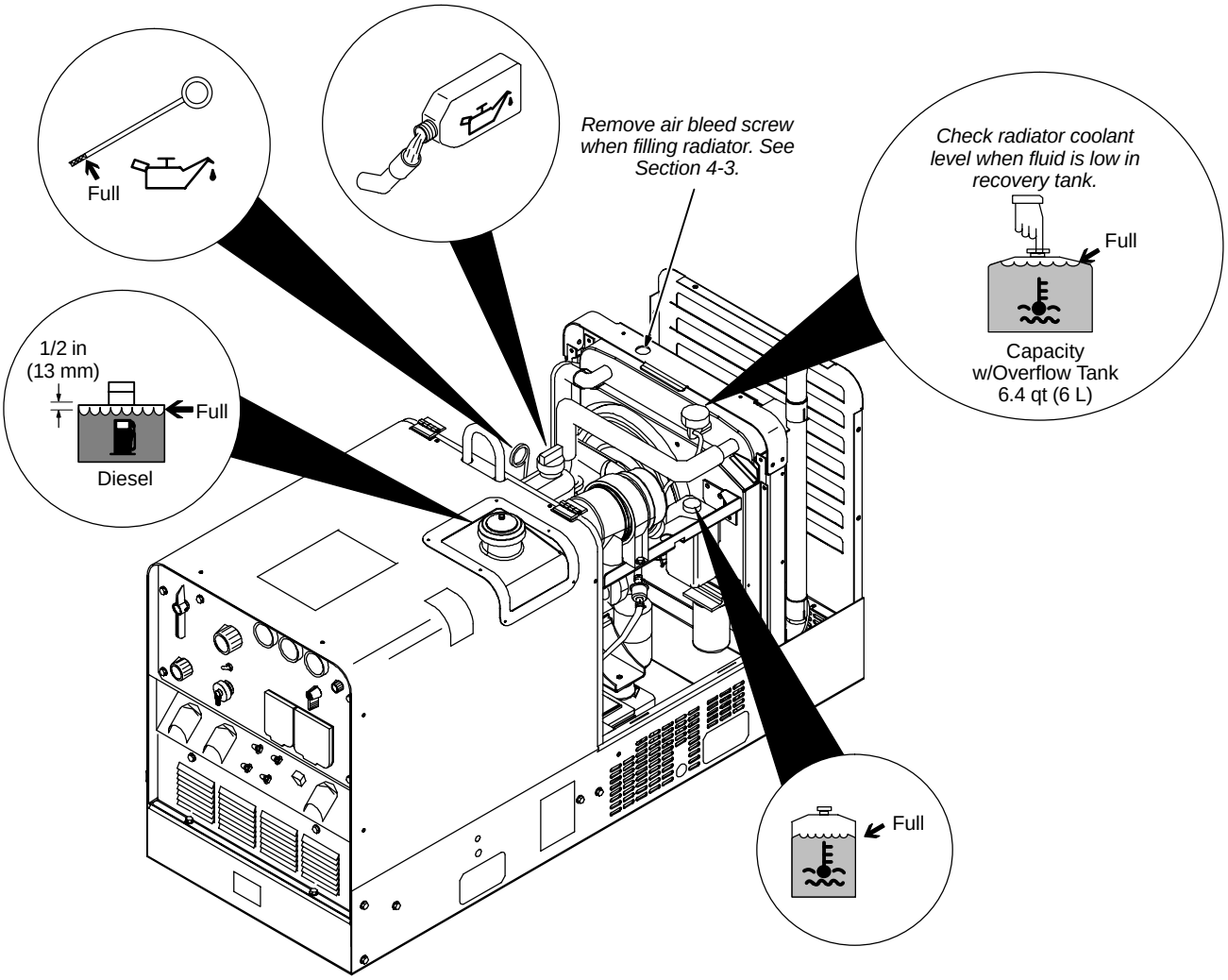
4 Grounding Cable

Use #10 AWG or larger insulated copper wire.

▲ **If unit does not have GFCI receptacles, use GFCI-protected extension cord.**

install1 10/00 – Ref. ST-800 652 / Ref. ST-800 477-A / ST-158 936-A / S-0854

4-2. Engine Prestart Checks


Full
Remove air bleed screw when filling radiator. See Section 4-3.
Check radiator coolant level when fluid is low in recovery tank.
Full
Capacity w/Overflow Tank 6.4 qt (6 L)
1/2 in (13 mm)
Full
Diesel
Full

Ref. 802 579-B

Check all fluids daily. Engine must be cold and on a level surface. Unit is shipped with 10W30 engine oil.

Engine stops if oil pressure is too low or engine temperature is too high.

☞ *This unit has a low oil pressure shutdown switch. However, some conditions may cause engine damage before the engine shuts down. Check oil level often and do not use the oil pressure shutdown system to monitor oil level.*

Follow run-in procedure in engine manual. If unburned fuel and oil collect in exhaust pipe during run-in, see Section 9.

Fuel

▲ **Do not use gasoline. Gasoline will damage engine.**

Add fresh diesel fuel before starting engine the first time (see maintenance label for specifications). Fill fuel tank up to 1/2 in. (13 mm) from top to allow room for expansion.

Do not run out of fuel or air enters fuel system and causes starting problems. See engine manual to bleed air from fuel system.

Oil

After fueling, check oil with unit on level surface. If oil is not up to full mark on dipstick, add oil (see maintenance label).

▲ **Engine may use oil and wetstacking may occur during run-in period. Check oil several times daily during run-in.**

Coolant

Check coolant level in recovery tank before starting unit the first time. Add coolant if coolant is below bottom of radiator filler neck (see Section 4-3 for radiator filling instructions.

Check coolant in recovery tank daily. If coolant is below Full level, add coolant until coolant level in tank is between Full and Low levels. If recovery tank coolant level was low, also check coolant level in radiator (see Section 4-3).

Engine coolant is a mixture of water and ethylene glycol base antifreeze. A solution of 50% antifreeze and 50% water must be used in this engine. Do not use 100% antifreeze or severe damage will occur.

Keep radiator and air intake clean and free of dirt.

▲ **Incorrect engine temperature can damage engine. Do not run engine without a properly working thermostat and radiator cap.**

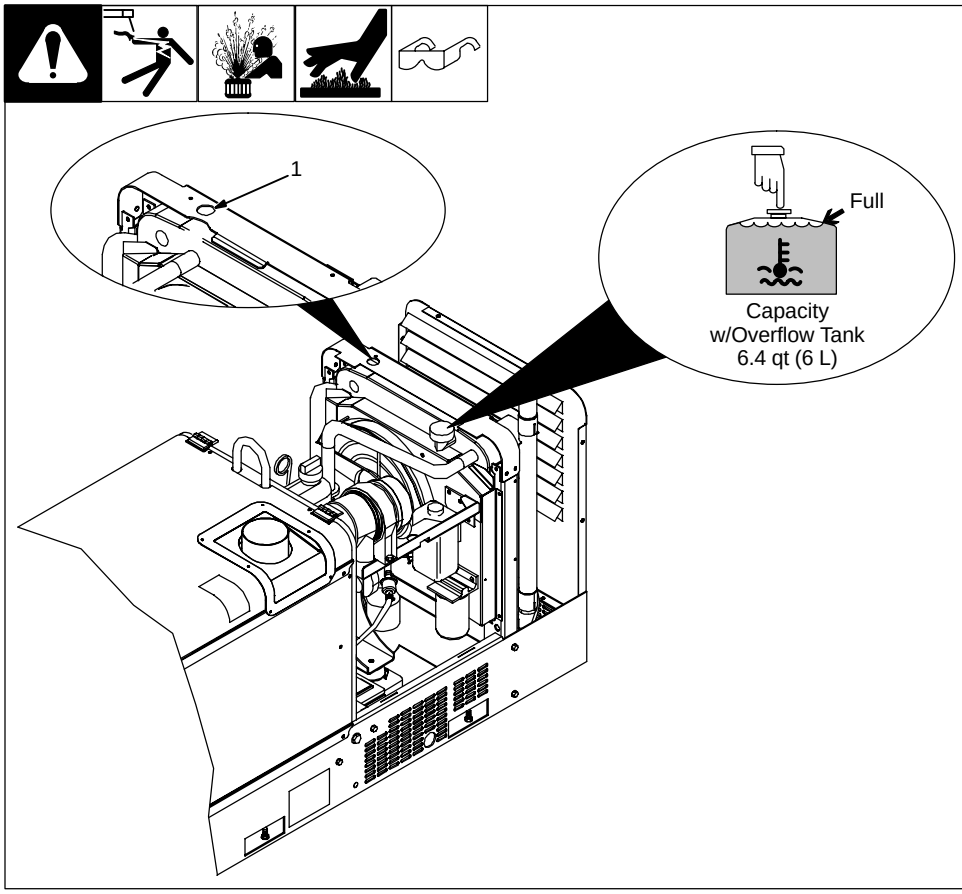
☞ *To improve cold weather starting:*

Keep battery in good condition. Store battery in warm area off concrete surface.

Use fuel formulated for cold weather (diesel fuel can gel in cold weather). Contact local fuel supplier for fuel information.

Use correct grade oil for cold weather.

4-3. Adding Coolant To Radiator



▲ **Stop engine and let cool.**

☞ *Check coolant level according to Section 4-2 before starting this procedure.*

If coolant level is below bottom of radiator filler neck, add coolant as follows:

1 Radiator Air Bleed Screw

Remove radiator air bleed screw. Add coolant to radiator until coolant is at bottom of filler neck. This ensures all air is purged from the system.

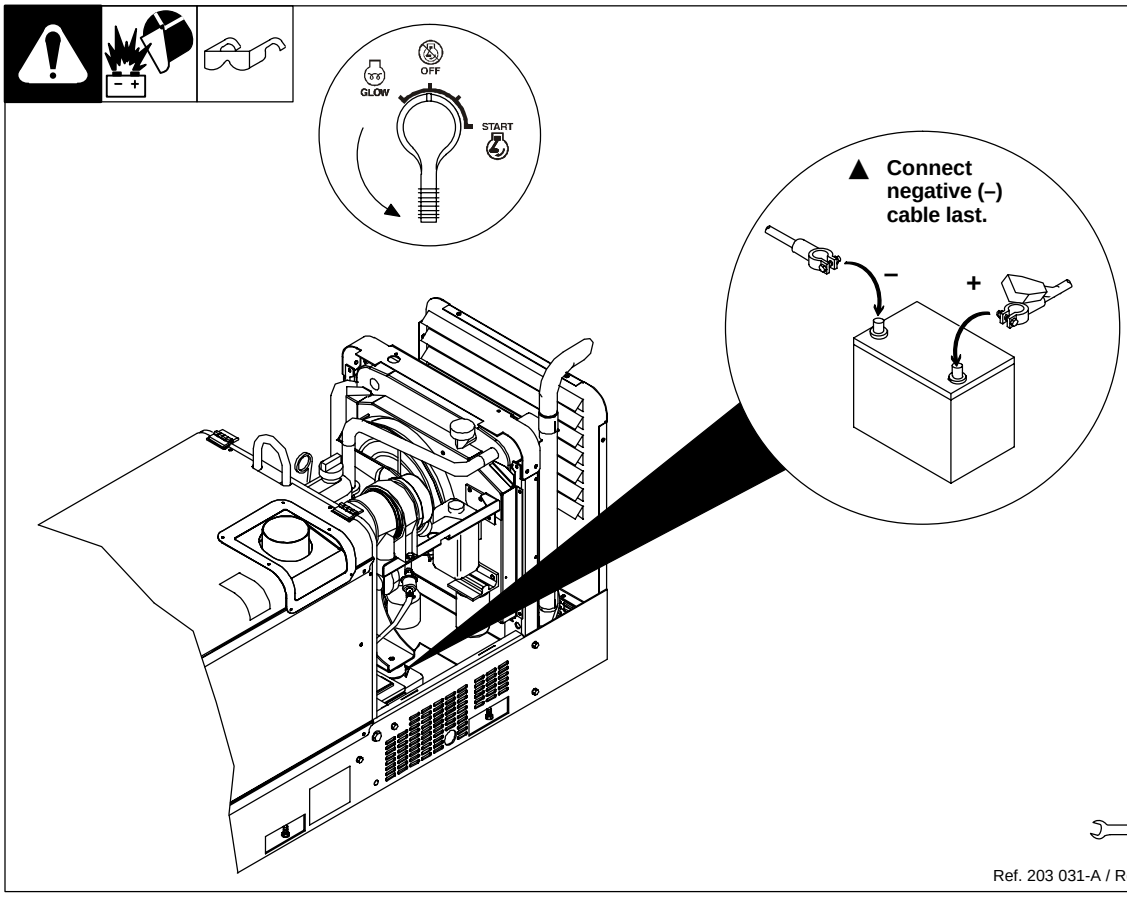
Reinstall screw and radiator cap. Check coolant level in recovery tank (see Section 4-2).

Engine coolant is a mixture of water and ethylene glycol base antifreeze. A solution of 50% antifreeze and 50% water must be used in this engine. Do not use 100% antifreeze or severe damage will occur.

Tools Needed:

Ref. 802 579-B

4-4. Connecting The Battery



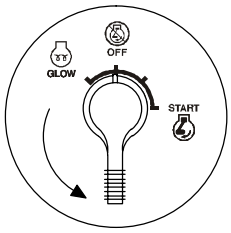
Tools Needed:

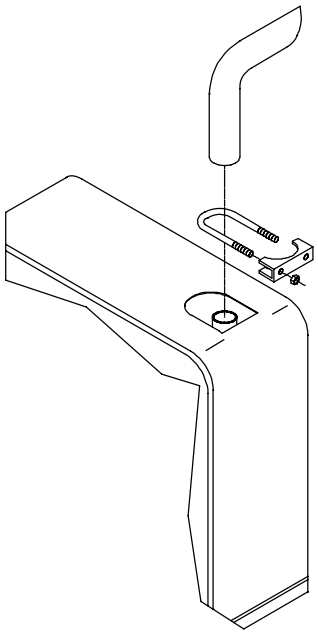
3/8, 1/2 in

Ref. 203 031-A / Ref. 802 579-B / Ref. S-0756-D

4-5. Installing Exhaust Pipe

☞ *Point exhaust pipe in desired direction but always away from front panel and direction of travel.*



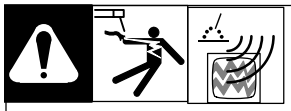


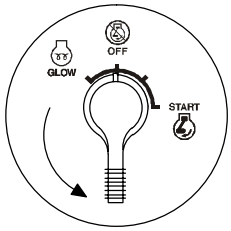
Tools Needed:

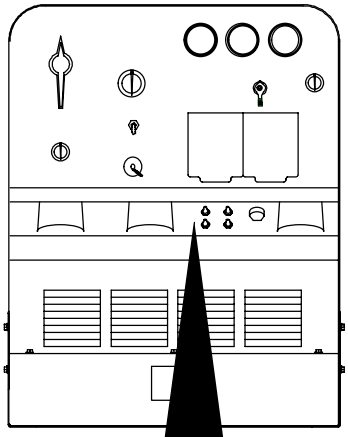
1/2 in

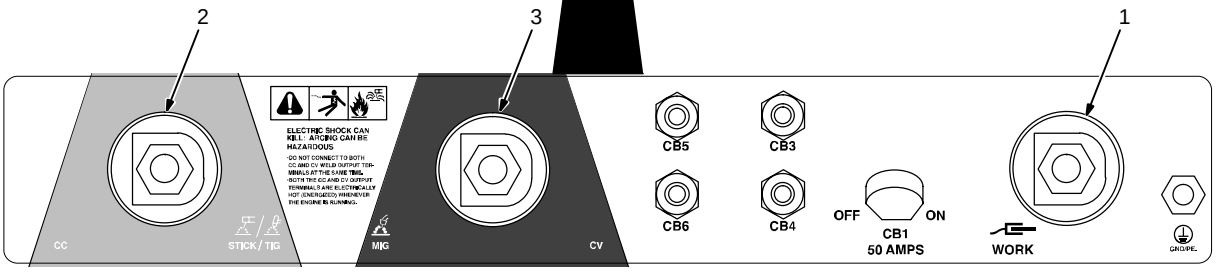
802 173-C / Ref. 203 031-A

4-6. Connecting To Weld Output Terminals









▲ **Do not connect to CC and CV terminals at the same time.**

1 Work Weld Output Terminal

2 CC (Stick/TIG) Weld Output Terminal

3 CV (MIG) Weld Output Terminal

For MIG welding, connect work cable to Work terminal and wire feeder cable to CV (MIG) terminal.

For Stick/TIG welding, connect work cable to Work terminal and electrode holder cable to CC (Stick/TIG) terminal.

802 580-A / 203 031-A

4-7. Selecting Weld Cable Sizes*

Weld Output Terminals ▲ Stop engine before connecting to weld output terminals. ▲ Do not use worn, damaged, undersized, or poorly spliced cables.	Welding Amperes	Weld Cable Size** and Total Cable (Copper) Length in Weld Circuit Not Exceeding***							
		100 ft (30 m) or Less		150 ft (45 m)	200 ft (60 m)	250 ft (70 m)	300 ft (90 m)	350 ft (105 m)	400 ft (120 m)
		10 – 60% Duty Cycle	60 – 100% Duty Cycle	10 – 100% Duty Cycle					
	100	4 (20)	4 (20)	4 (20)	3 (30)	2 (35)	1 (50)	1/0 (60)	1/0 (60)
	150	3 (30)	3 (30)	2 (35)	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	3/0 (95)
	200	3 (30)	2 (35)	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	4/0 (120)
	250	2 (35)	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2 ea. 2/0 (2x70)	2 ea. 2/0 (2x70)
	300	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2 ea. 2/0 (2x70)	2 ea. 3/0 (2x95)	2 ea. 3/0 (2x95)
	350	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2 ea. 2/0 (2x70)	2 ea. 3/0 (2x95)	2 ea. 3/0 (2x95)	2 ea. 4/0 (2x120)
	400	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2 ea. 2/0 (2x70)	2 ea. 3/0 (2x95)	2 ea. 4/0 (2x120)	2 ea. 4/0 (2x120)

* This chart is a guideline and may not suit all applications. If cable overheating occurs (normally you can smell it), use next size larger cable.

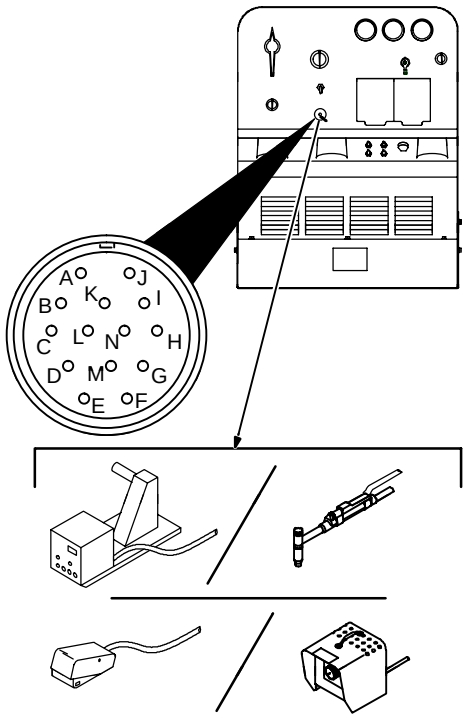
**Weld cable size (AWG) is based on either a 4 volts or less drop or a current density of at least 300 circular mils per ampere.
( ) = mm^2 for metric use

S-0007-E–

***For distances longer than those shown in this guide, call a factory applications representative at 920-735-4505.

4-8. Remote 14 Receptacle RC1 Information

NOTE *Engine runs at weld/power speed whenever a device connected to the remote 14 receptacle is running.*



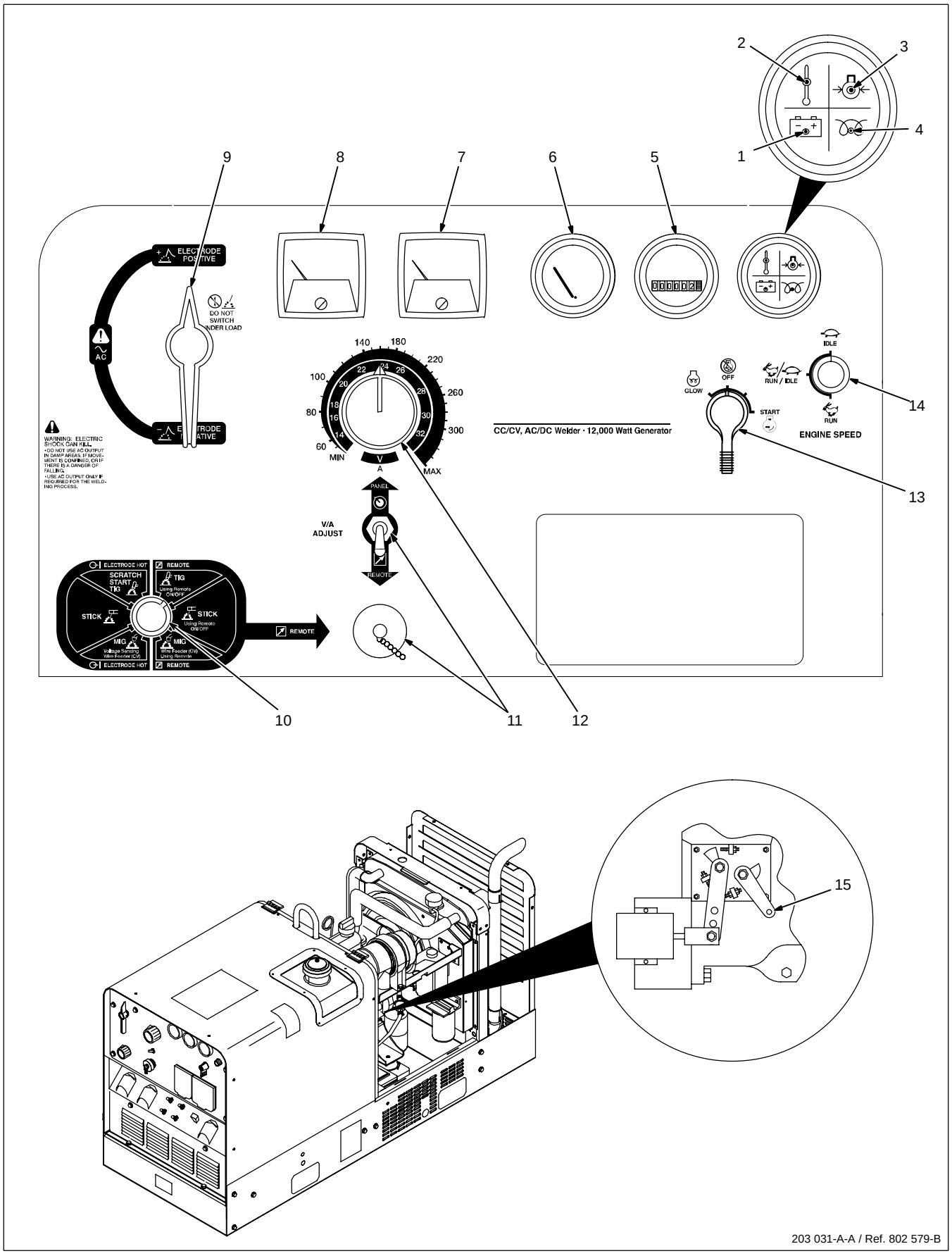
REMOTE 14	Socket*	Socket Information
24 VOLTS AC OUTPUT (CONTACTOR)	A	24 volts ac. Protected by circuit breaker CB5.
	B	Contact closure to A completes 24 volts ac contactor control circuit.
115 VOLTS AC OUTPUT (CONTACTOR)	I	115 volts ac. Protected by circuit breaker CB6.
	J	Contact closure to I completes 115 volts ac contactor control circuit.
REMOTE OUTPUT CONTROL	C	Output to remote control; 0 to +10 volts dc.
	D	Remote control circuit common.
	E	0 to +10 volts dc input command signal from remote control. Voltage is dependent on front panel V/A Adjustment control setting.
GND	G	Circuit common for 24 and 115 volts ac circuits.
	K	Chassis common.

*The remaining sockets are not used.

Notes

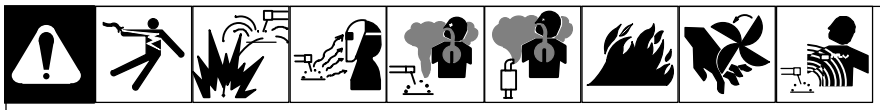
SECTION 5 – OPERATING WELDING GENERATOR

5-1. Controls (See Section 5-2)



203 031-A-A / Ref. 802 579-B

5-2. Description Of Controls (See Section 5-1)



Engine Lights

1 Battery Charging Light

Light goes on if engine alternator is not charging battery. Engine continues to run.

▲ **Stop engine and fix trouble if Battery Charging light goes on.**

2 Engine Temperature Light

Light goes on and engine stops if engine temperature is too high.

▲ **Stop engine and fix trouble if Engine Temperature light goes on.**

3 Engine Oil Pressure Light

Light goes on and engine stops if oil pressure is too low. Light goes on momentarily during start-up but goes out when engine reaches normal oil pressure.

▲ **Stop engine and fix trouble if Engine Oil Pressure light stays on after start-up.**

4 Glow Plug Light

LIght is not active on this model.

Glow plug warms in about six seconds and engine can be started (see starting instructions following).

▲ **Do not use glow plug longer than 20 seconds.**

Engine Gauges

5 Engine Hour Meter

6 Fuel Gauge

Use gauge to check fuel level.

Weld Controls

7 Ammeter (Optional)

Meter displays weld amperage at the weld output terminals, but not necessarily the welding arc due to resistance of cables and connections.

8 Voltmeter (Optional)

Meter displays weld voltage at the weld terminals, but not necessarily the welding arc due to resistance of cables and connections.

9 DC Polarity/AC Selector Switch

▲ **Do not switch under load.**

Use switch to select AC weld output or polarity of DC weld output.

10 Process/Contactor Switch

See Section 5-3 for Process/Contactor switch information.

11 V/A (Voltage/Amperage) Adjust Switch And Remote 14 Receptacle

For front panel control, place switch in Panel position and use the V/A Adjustment control.

For remote control, make connections to Remote 14 receptacle, and place switch in Remote position (see Sections 4-8 and 5-5). The value selected on V/A Adjustment control is the maximum available at the remote.

☞ *Set V/A Adjustment control (item12) to max for MIG welding.*

12 V/A (Voltage/Amperage) Adjustment Control

With Process/Contactor switch in any Stick or TIG setting, use control to adjust amperage. With Process/Contactor switch in any MIG position, use control to adjust voltage.

Engine Starting Controls

13 Engine Control Switch

Use switch to start engine, stop engine, and operate glow plug for cold weather starting. Glow plug warms in about six seconds and engine can then be started (see starting instructions following).

14 Engine Speed Switch

Use switch to select engine speed.

Place switch in Idle position to lock engine at idle speed during start-up, and to CC weld at idle speed (up to 180 A). See Section 5-4 for information on operating at idle speed.

In Run/Idle position, engine runs at idle speed at no load and weld/power speed under load. In Run position, engine runs at weld/power speed.

☞ *Place switch in Run or Run/Idle position when using generator power.*

☞ *Place switch in Run position to operate most GMAW equipment.*

To Start:

▲ **Do not use ether as a starting aid. Using ether voids warranty.**

Above 32° F: turn Engine Speed switch to Idle and Engine Control switch to Start. Release Engine Control switch when engine starts and Engine Oil Pressure light goes out.

☞ *If engine does not start, let engine come to a complete stop before attempting restart.*

Below 32° F: turn Engine Speed switch to Idle. Turn Engine Control switch to Glow Plug position for about six seconds, and then turn Engine Control switch to Start. Release switch when engine starts and Engine Oil Pressure light goes out. Do not crank engine while engine is turning.

☞ *If engine does not start, let engine come to a complete stop before attempting restart.*

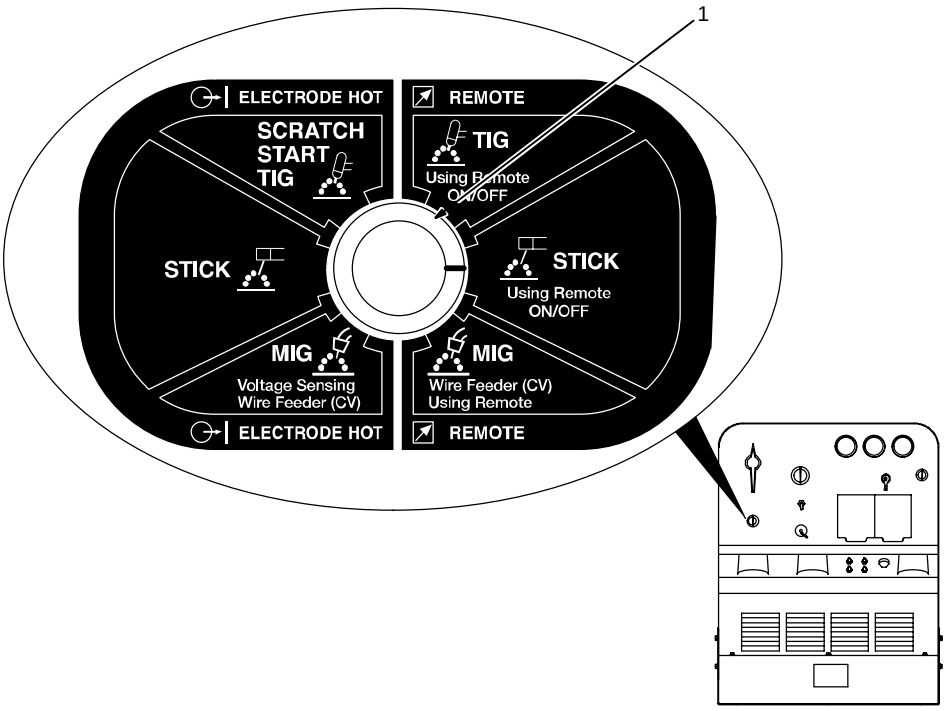
To Stop: turn Engine Control switch to Off position.

☞ *Push engine stop lever to stop engine if Engine Control switch does not work (see item 15).*

15 Engine Stop Lever

Use lever to stop engine if Engine Control switch does not work.

5-3. Process/Contactor Switch



1 Process/Contactor Switch

▲ **Weld output terminals are energized when Process/Contactor switch is in any Electrode Hot position and the engine is running.**

Use switch to select weld process and weld output on/off control (see table below and Section 5-5).

Place switch in Remote positions to turn weld output on and off with a device connected to the remote 14 receptacle.

Place switch in Electrode Hot positions for weld output to be on whenever the engine is running.

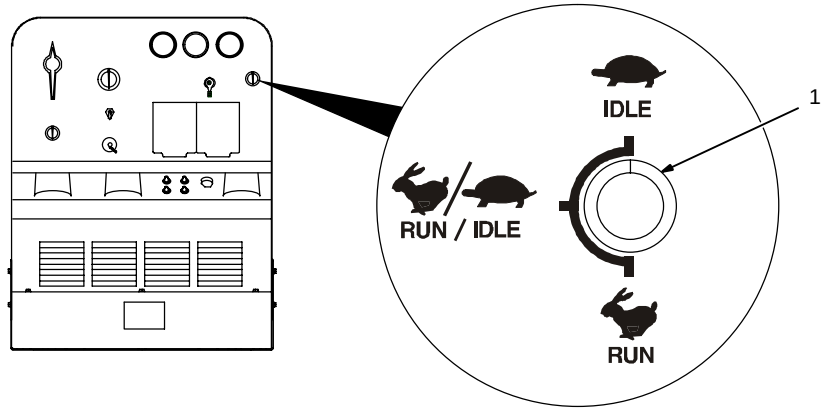
Use Stick position for air carbon arc (CAC-A) cutting and gouging.

203 031-A-A / 802 580-A

Process/Contactor Switch Settings

Switch Setting	Process	Output On/Off Control
Remote – TIG	GTAW With HF Unit, Pulsing Device, Or Remote Control	At Remote 14 Receptacle
Remote – Stick	Stick (SMAW) With Remote On/Off	At Remote 14 Receptacle
Remote – MIG	MIG (GMAW)	At Remote 14 Receptacle
Electrode Hot – MIG	MIG (GMAW)	Electrode Hot
Electrode Hot – Stick	Stick (SMAW), Air Carbon Arc (CAC-A) Cutting And Gouging	Electrode Hot
Electrode Hot – Scratch Start TIG	Scratch Start TIG (GTAW)	Electrode Hot

5-4. Operating Unit At Idle Speed



1 Engine Speed Switch

Use Idle speed when:

- Starting
- Stick welding at up to 180 A.

  To weld above 180 A, place Engine Speed switch in Run or Run/Idle position.

When Stick welding at idle speed, the front panel Voltage/Amperage control setting is accurate up to 180 A. Above 180 A, weld output is slightly less than Voltage/Amperage control setting.

☞ *Place switch in Run or Run/Idle position when using generator power.*

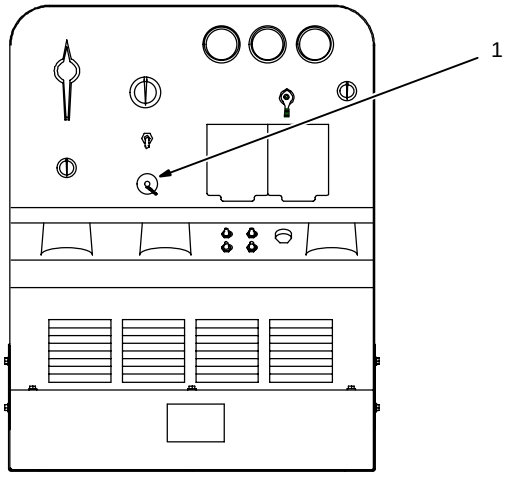
☞ *Place switch in Run position to operate most GMAW equipment.*

203 031-A / 802 580-A

5-5. Remote Voltage/Amperage Control

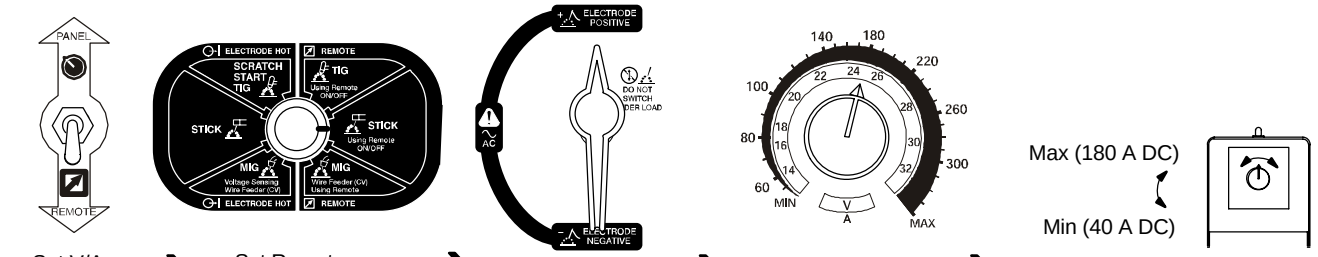
1 Remote 14 Receptacle RC1

Connect optional remote control to RC1 (see Section 4-8).



Example: Combination Remote Amperage Control (Stick)

In Example:
Process = Stick (Using Remote On/Off)
Min = 40 A DC
Max = 180 A DC

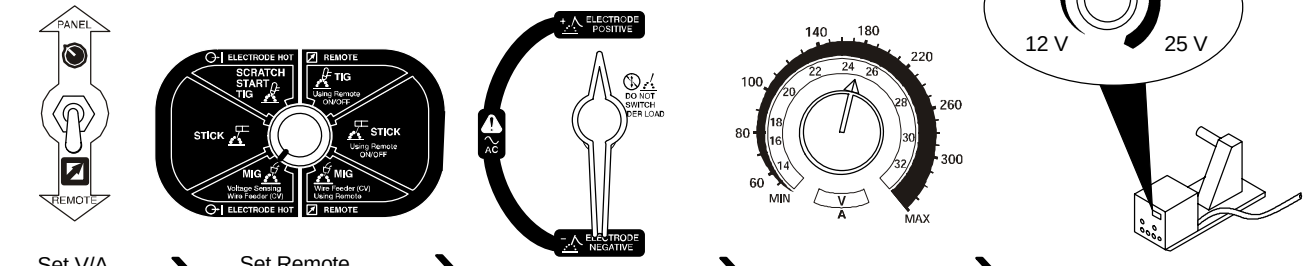


Set V/A Adjust Switch → Set Remote Process → Set Polarity → Set V/A Control → Adjust Optional Remote Control

---

Example: Combination Remote Voltage Control (MIG)

In Example:
Process = MIG
Min = 12 V DC
Max = About 25 V DC

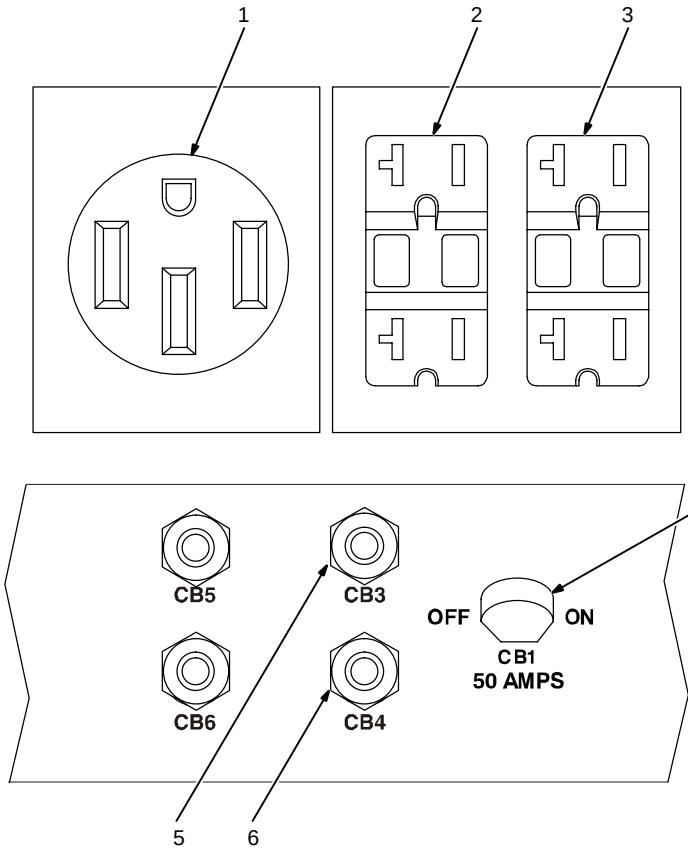


Set V/A Adjust Switch → Set Remote Process → Set Polarity → Set V/A Control To Max → Adjust Voltage

0774 / Ref. 203 031-A

SECTION 6 – OPERATING AUXILIARY EQUIPMENT

6-1. Generator Power Receptacles And Circuit Breakers



Simultaneous Welding And Generator Power Output

Weld Current Amperes	Watts	120 V Receptacle Amperes	240 V Receptacle Amperes
0	12000	50	50
50	10900	50	46
100	9100	50	38
150	7600	50	32
200	6400	50	27
250	4000	34	17
300	1900	16	8
350	1000	8	4

▲ **If unit does not have GFCI receptacles, use GFCI-protected extension cord.**

☞ *Generator power decreases as weld current increases.*

1 240 V 50 A AC Receptacle RC3

RC3 supplies 60 Hz single-phase power at weld/power speed. Maximum continuous output is 10 kVA/kW.

2 120 V 20 A AC GFCI Duplex Receptacle GFCI-4

3 120 V 20 A AC GFCI Duplex Receptacle GFCI-5

GFCI-4 and GFCI-5 supply 60 Hz single-phase power at weld/power speed. Maximum output from GFCI-4 or GFCI-5 is 2.4 kVA/kW.

4 Circuit Breaker CB1

CB1 protects RC3, GFCI-4, and GFCI-5 from overload. If CB1 opens, the receptacles do not work.

5 Circuit Breaker CB3

6 Circuit Breaker CB4

CB3 protects GFCI-4 and CB4 protects GFCI-5 from overload. If a circuit breaker opens, the receptacle does not work.

☞ *Move switch (CB1) or press button (CB3, CB4) to reset circuit breaker. If breaker continues to open, contact Factory Authorized Service Agent.*

Combined output of all receptacles limited to 10 kVA/kW rating of the generator.

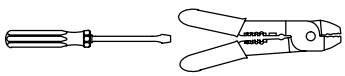
EXAMPLE: If 19 A is drawn from each 120 V duplex receptacle, only 23 A is available at the 240 V receptacle:

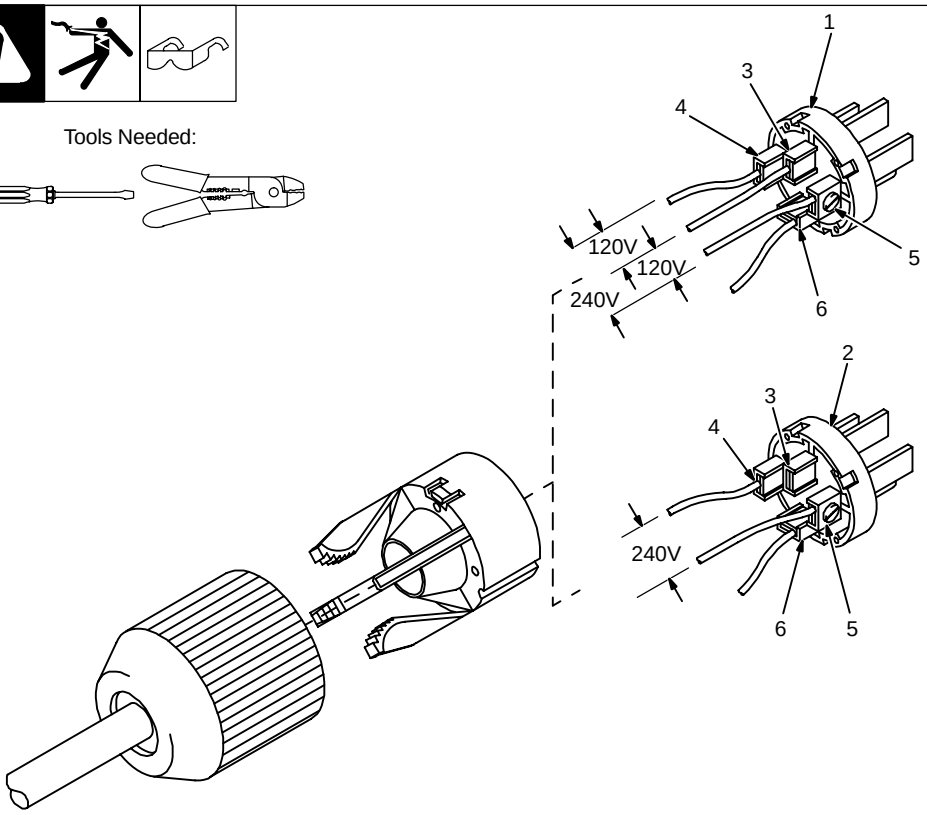
2 x (120 V x 19 A) + (240 V x 23 A) = 10 kVA/kW

Ref. ST-203 031-A

6-2. Wiring Instructions For Optional 240 Volt, Single-Phase Plug (NEMA 14-50P)

Tools Needed:





The plug can be wired for a 240 V, 2-wire load or a 120/240V, 3-wire load. See circuit diagram.

1 Plug Wired for 120/240 V, 3-Wire Load

When wired for 120 V loads, each duplex receptacle shares a load with one half of 240 V receptacle.

2 Plug Wired for 240 V, 2-Wire Load

3 Neutral (Silver) Terminal

4 Load 1 (Brass)Terminal

5 Load 2 (Brass) Terminal

6 Ground (Green) Terminal

Strip cord jacket back enough to separate conductors.

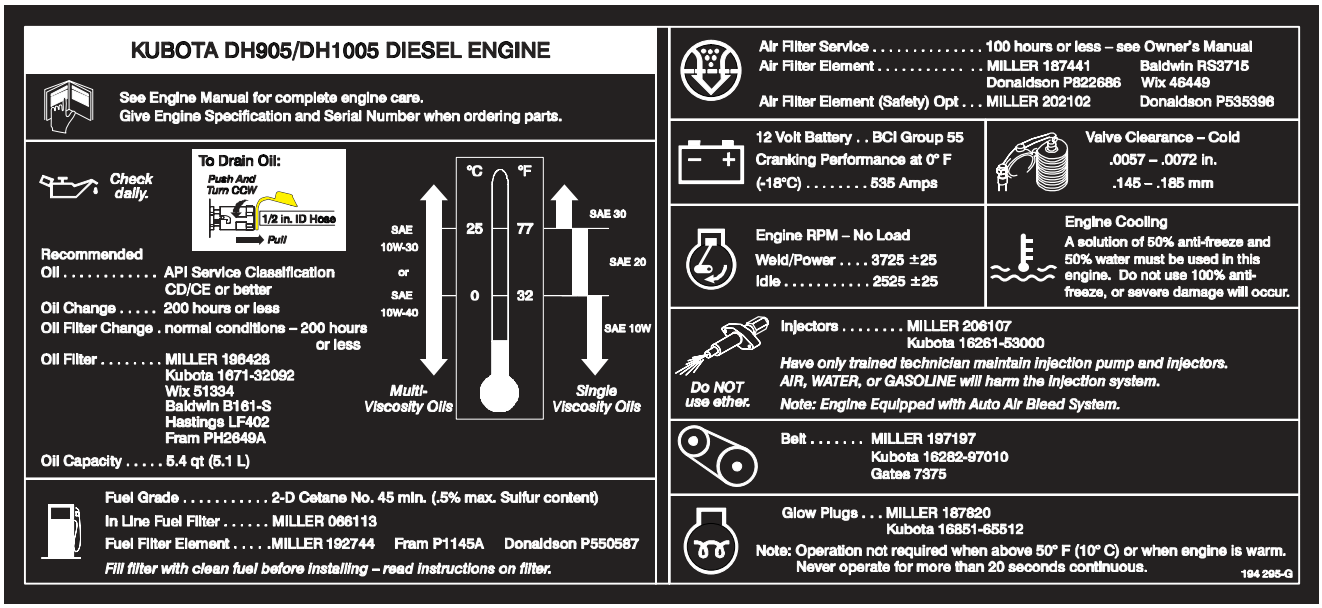
Strip conductors enough to make good contact with plug terminals. Make plug connections and reinstall outer shell and cord grip.

Tighten assembly screws onto shell. Do not overtighten.

Plug1 7/99 – ST-120 813-D

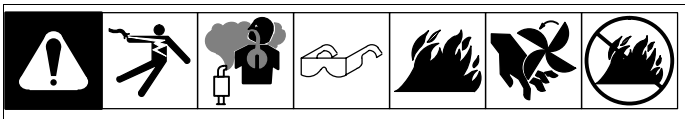
SECTION 7 – MAINTENANCE AND TROUBLESHOOTING

7-1. Maintenance Label


KUBOTA DH905/DH1005 DIESEL ENGINE
See Engine Manual for complete engine care.
Give Engine Specification and Serial Number when ordering parts.
Check daily.
To Drain Oil:
Push And Turn CCW
1/2 in. ID Hose
Pull
Recommended
Oil . . . . . API Service Classification CD/CE or better
Oil Change . . . . . 200 hours or less
Oil Filter Change . normal conditions – 200 hours or less
Oil Filter . . . . . MILLER 196428
Kubota 1671-32092
Wix 51334
Baldwin B161-S
Hastings LF402
Fram PH2649A
Oil Capacity . . . . . 5.4 qt (5.1 L)
°C °F
25 77
0 32
SAE 10W-30 or SAE 10W-40
SAE 30
SAE 20
SAE 10W
Multi-Viscosity Oils
Single Viscosity Oils
Fuel Grade . . . . . 2-D Cetane No. 45 min. (.5% max. Sulfur content)
In Line Fuel Filter . . . . . MILLER 066113
Fuel Filter Element . . . . .MILLER 192744 Fram P1145A Donaldson P550587
Fill filter with clean fuel before installing – read instructions on filter.
Air Filter Service . . . . . 100 hours or less – see Owner's Manual
Air Filter Element . . . . . MILLER 187441 Baldwin RS3715
Donaldson P822686 Wix 46449
Air Filter Element (Safety) Opt . . . MILLER 202102 Donaldson P535398
12 Volt Battery . . BCI Group 55
Cranking Performance at 0° F (-18°C) . . . . . 535 Amps
Valve Clearance – Cold
.0057 – .0072 in.
.145 – .185 mm
Engine RPM – No Load
Weld/Power . . . . 3725 ±25
Idle . . . . . 2525 ±25
Engine Cooling
A solution of 50% anti-freeze and 50% water must be used in this engine. Do not use 100% anti-freeze, or severe damage will occur.
Injectors . . . . . MILLER 206107
Kubota 16261-53000
Have only trained technician maintain injection pump and injectors.
AIR, WATER, or GASOLINE will harm the injection system.
Note: Engine Equipped with Auto Air Bleed System.
Do NOT use ether.
Belt . . . . . MILLER 197197
Kubota 16282-97010
Gates 7375
Glow Plugs . . . MILLER 187820
Kubota 16851-65512
Note: Operation not required when above 50° F (10° C) or when engine is warm.
Never operate for more than 20 seconds continuous.
194 295-G

7-2. Routine Maintenance

Note ☞ *Follow the storage procedure in the engine owner's manual if the unit will not be used for an extended period.*



Recycle engine fluids.

▲ **Stop engine before maintaining.**

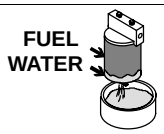
☞ *See also Engine Manual and Maintenance Label. Service engine more often if used in severe conditions.*

* To be done by Factory Authorized Service Agent.

8 h

Wipe Up Spills.

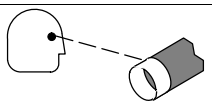
Check Fluid Levels. See Section 4-2.



Drain Water From Fuel System. See Section 7-5.

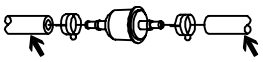
20 h

Check and clean optional spark arrestor screen. See Section 7-3.

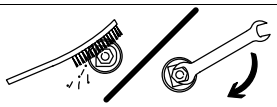


50 h

Check fuel lines and connections. See Section 7-5.



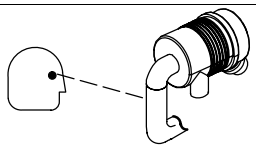
Clean and tighten weld terminals.



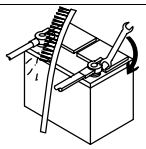
100 h

Service air filter element. See Section 7-4.

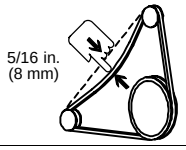
Check air cleaner hoses for cracks and loose clamps.



Clean and tighten battery connections.

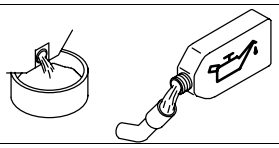


Check belt tension.

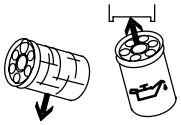


200 h

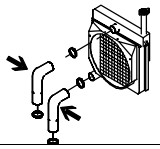
Change oil. See Section 7-5 and maintenance label.



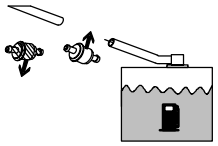
Change oil filter. See Section 7-5 and maintenance label.



Check radiator hoses and clamps.



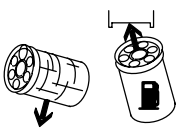
Replace primary (in-line) fuel filter. See Section 7-5.



Replace unreadable labels.

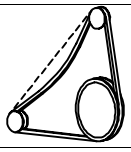
400 h

Replace secondary fuel filter. See Section 7-5.

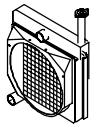


500 h

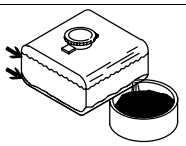
Replace fan belt.



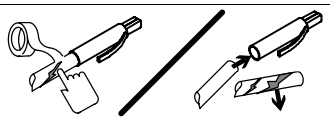
Flush radiator.



Drain sludge from fuel tank.

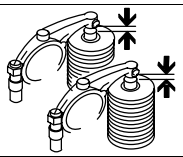


Repair or replace cracked cables.



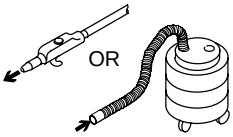
800 h

Check valve clearance.*

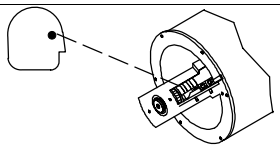


1000 h

Blow out or vacuum inside. During heavy service, clean monthly.

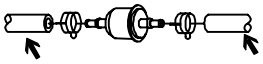


Service welding generator brushes and slip rings. Service more often in dirty conditions.*

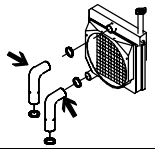


2000 h

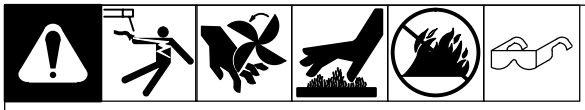
Replace fuel lines and clamps. See Section 7-5.

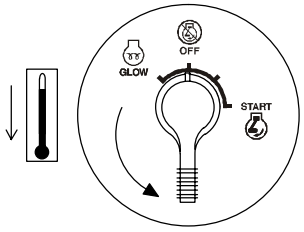


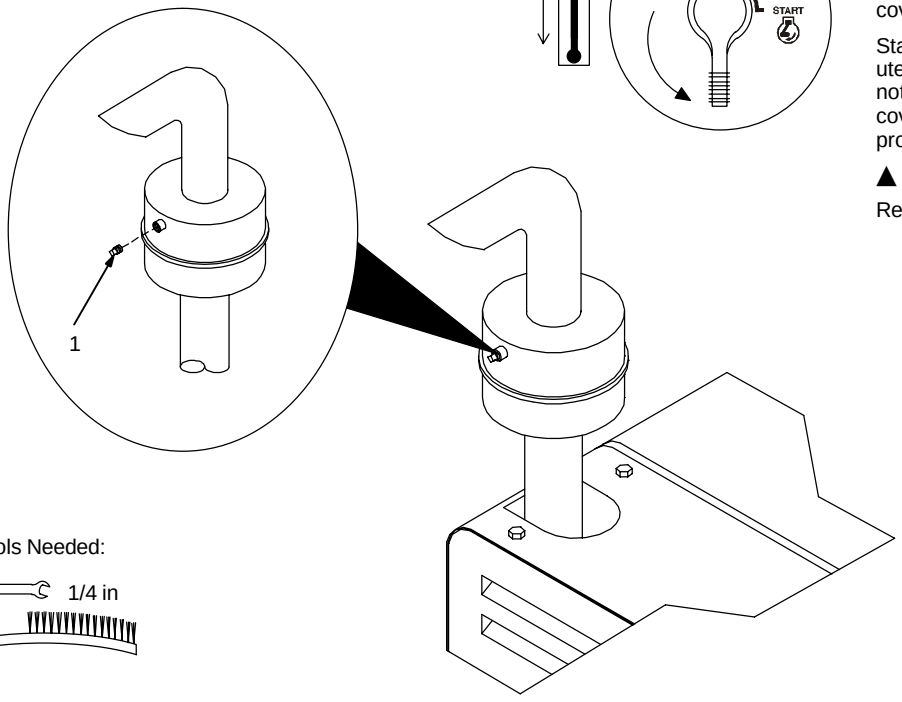
Replace radiator coolant and hoses. See Section 7-6.



7-3. Servicing Optional Spark Arrestor







▲ **Stop engine and let cool.**

1 Cleanout Plug

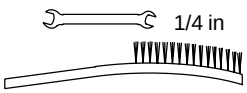
Remove plug and remove any dirt covering cleanout hole.

Start engine and run several minutes to blow out cleanout hole. If nothing blows out of hole, briefly cover end of exhaust pipe with fireproof material.

▲ **Stop engine and let cool.**

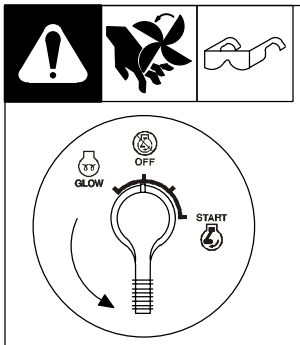
Reinstall cleanout plug.

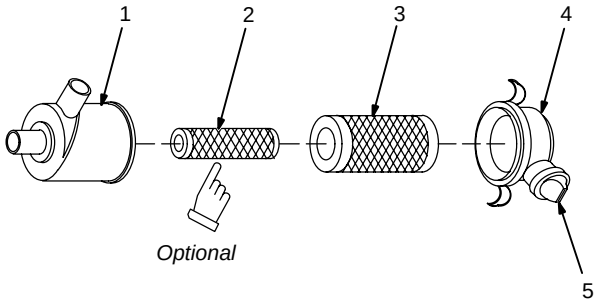
Tools Needed:



802 656

7-4. Servicing Air Cleaner





▲ **Stop engine.**

▲ **Do not run engine without air cleaner or with dirty element. Engine damage caused by using a damaged element is not covered by the warranty.**

☞ *The air cleaner primary element can be cleaned but the dirt holding capacity of the filter is reduced with each cleaning. The chance of dirt reaching the clean side of the filter while cleaning and the possibility of filter damage makes cleaning a risk. Consider the risk of unwarrantable equipment damage when determining whether to clean or replace the primary element.*

If you decide to clean the primary element, we strongly recommend installing an optional safety element to provide additional engine protection. ***Never clean a safety element.*** *Replace the safety element after servicing the primary element three times.*

Clean or replace primary element if dirty (see note above before cleaning). **Replace** primary element if damaged. Replace primary element yearly or after six cleanings.

1 Housing

2 Safety Element (Optional)

3 Primary Element

4 Dust Cap

5 Dust Ejector

To clean air filter:

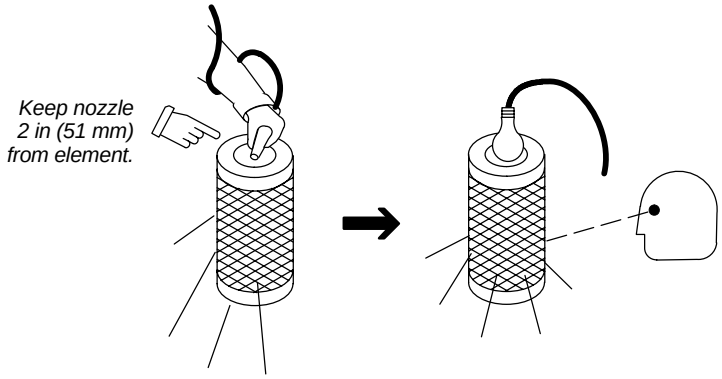
Wipe off cap and housing. Remove cap and dump out dust. Remove element(s). Wipe dust from inside cap and housing with damp cloth. Reinstall safety element (if present). Reinstall cap.

▲ **Do not clean housing with air hose.**

Clean primary element with compressed air only.

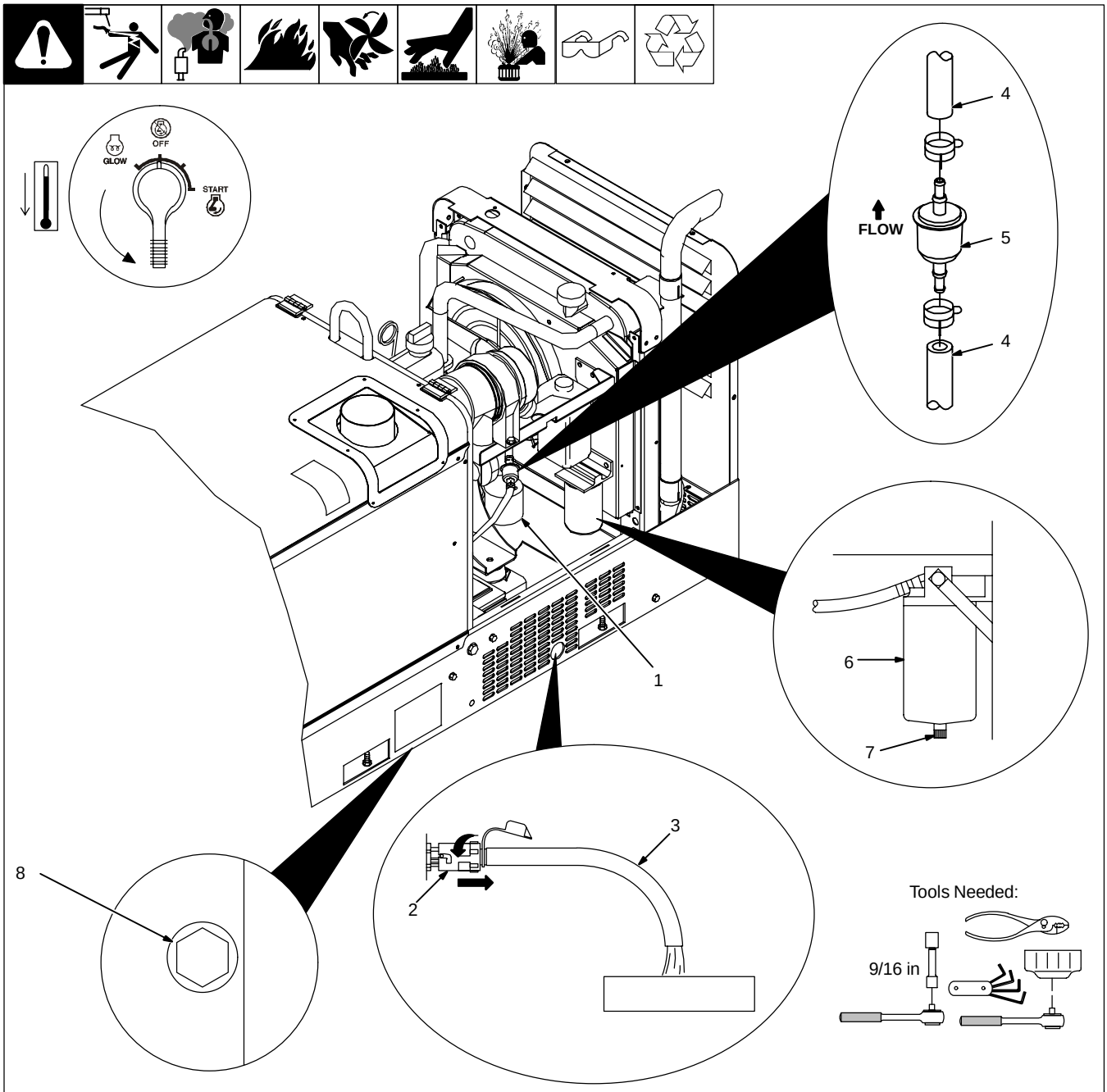
Air pressure must not exceed 100 psi (690 kPa). Use 1/8 in (3 mm) nozzle and keep nozzle at least 2 in (51 mm) from inside of element. Replace primary element if it has holes or damaged gaskets.

Reinstall primary element and cap (dust ejector down).



aircleaner1 9/00 – ST-153 929-B / ST-153 585 / Ref. S-0698-B

7-5. Servicing Engine Lubrication And Fuel Systems



Ref. 802 579-B / Ref. 203 031-A / S-0842

▲ **Stop engine and let cool.**

1 Oil Filter

2 Oil Drain Valve

3 1/2 ID Hose

4 Fuel Line

5 Primary (In-Line) Fuel Filter

6 Secondary (Canister) Fuel Filter

7 Petcock

8 Fuel Tank Sludge Drain

To change oil and filter:

Pull oil drain hose through access hole in base. Change engine oil and filter according to instructions in engine manual.

▲ **Close valve and valve cap before adding oil and running engine.**

Fill crankcase with new oil to full mark on dipstick (see Section 4-2).

To drain water from fuel system:

Open secondary fuel filter petcock and drain water into metal container. Close petcock when water-free fuel flows.

To change fuel filters:

Install new primary fuel filter as shown.

Replace secondary fuel filter according to engine manual.

Replace fuel lines if cracked or worn.

Wipe up any spilled fuel.

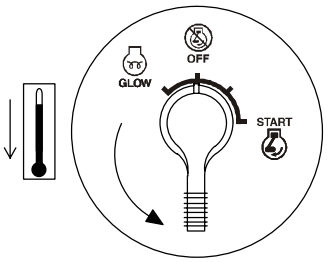
▲ **After servicing, start engine and check for fuel leaks.**

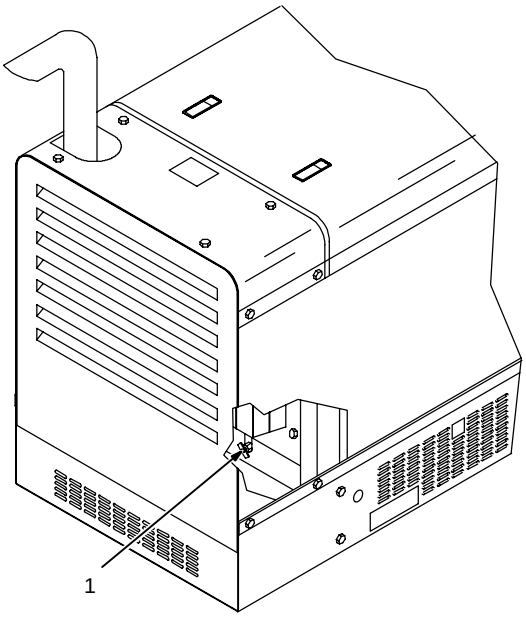
Stop engine, tighten connections as necessary, and wipe up fuel.

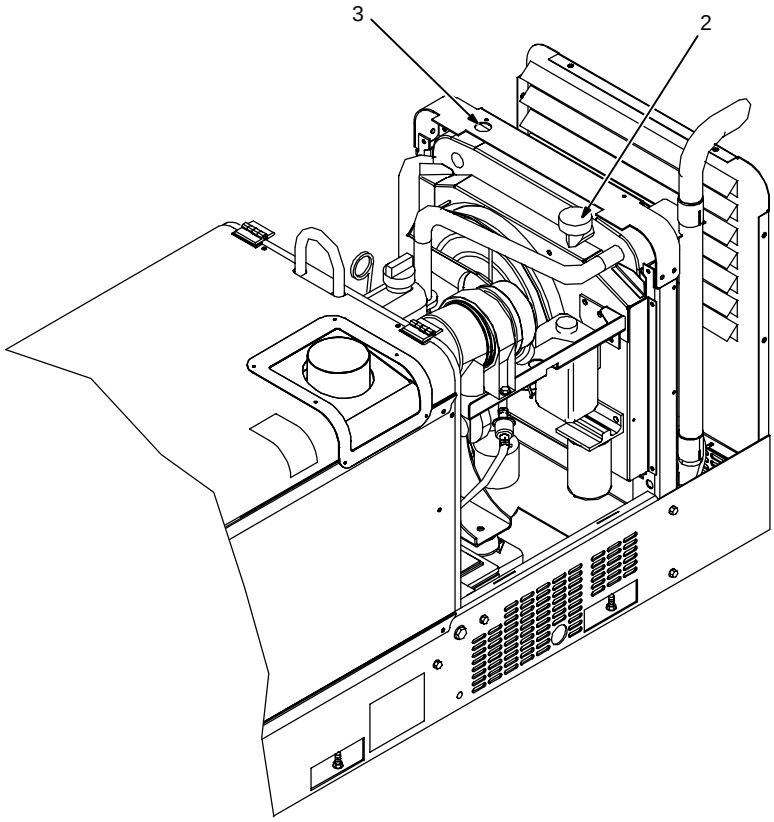
To drain sludge from fuel tank:

Put metal container under drain, and remove sludge drain plug. Reinstall plug when done.

7-6. Servicing Engine Cooling System







▲ **Stop engine and let cool.**

1 Radiator Draincock

2 Radiator Cap

3 Radiator Air Bleed Screw

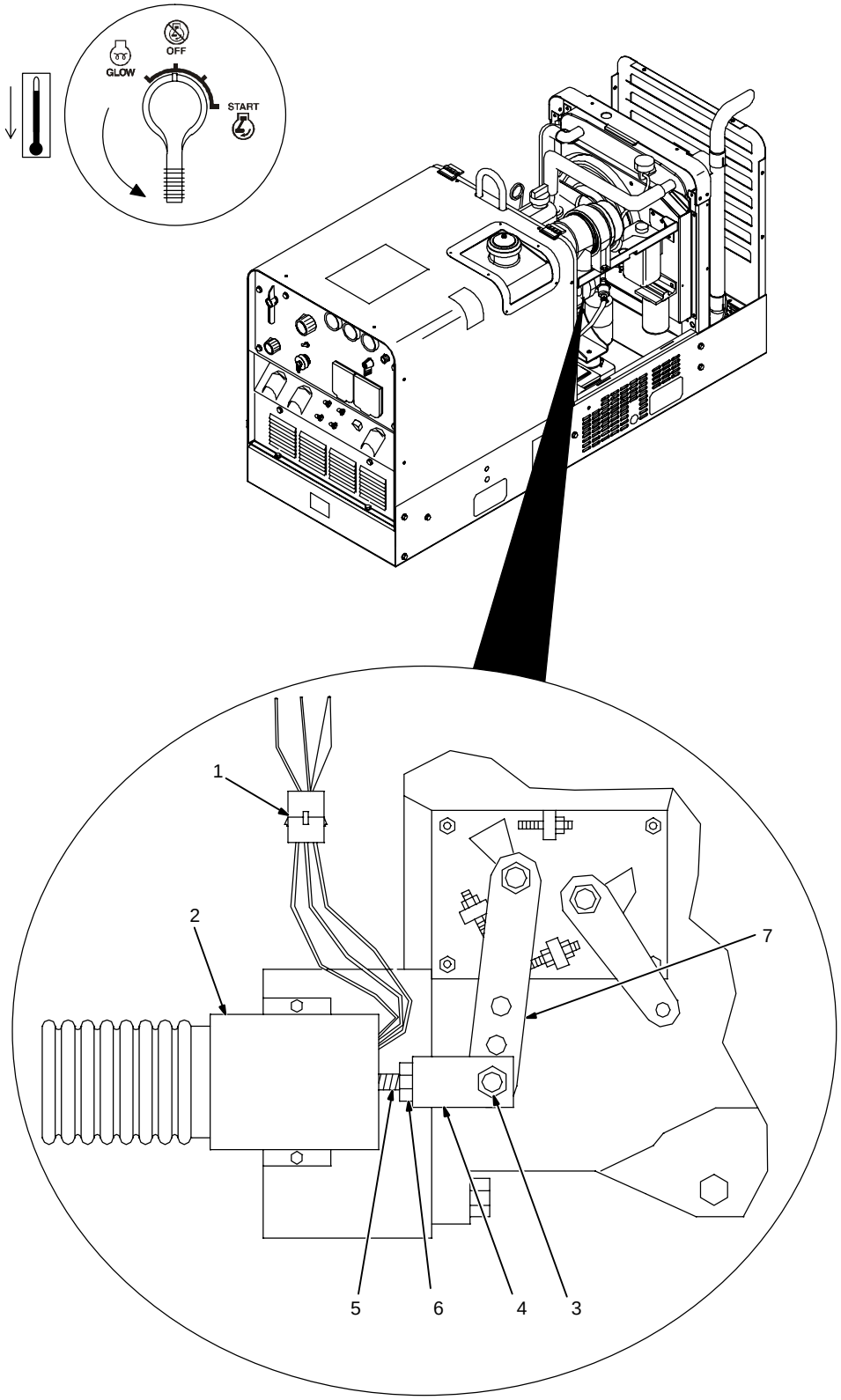
Change coolant according to engine manual. Add coolant according to Section 4-3).

Run engine until engine reaches normal operating temperature. Loosen air bleed screw to remove air from cooling system. Tighten screw.

Check coolant level in recovery tank. Add coolant if necessary

802 579-B / 802 581

7-7. Replacing Throttle Solenoid TS1



▲ **Stop engine, and let cool.**

▲ **Disconnect battery, negative (–) cable first.**

Remove right side engine panel.

1 Plug PLG11/Receptacle RC11
2 Throttle Solenoid TS1
3 Shoulder Bolt And Nut
4 Throttle Link
5 Throttle Solenoid Plunger Rod
6 Jam Nut
7 Throttle Arm

Disconnect solenoid plug PLG11 from wiring harness receptacle RC11.

Remove shoulder bolt and nut from throttle link.

Remove solenoid from mounting bracket.

Note how much thread is visible on solenoid plunger rod. Loosen jam nut just enough so throttle link can be removed from solenoid rod.

Install throttle link on new solenoid plunger rod. Turn link until the same amount of thread will be visible on plunger rod when the jam nut is tightened. (Do not tighten jam nut yet.)

Mount solenoid on bracket. Move solenoid plunger manually to align slot in throttle link with hole in throttle arm. Insert shoulder bolt through slot/hole and secure with nut.

☞ *Be sure solenoid plunger rod pulls all the way in "bottoms" when energized. If plunger rod does not pull all the way in, re-adjust throttle link.*

Tighten jam nut on solenoid plunger rod. Verify all other hardware is tight.

Connect solenoid plug PLG11 to wiring harness receptacle RC11.

Reconnect battery, negative (–) lead last.

Check engine speeds and adjust if necessary according to Section 7-8.

Reinstall side panel.

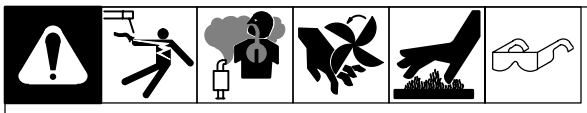
Tools Needed:

7/16, 3/8, 1/2 in
10 mm

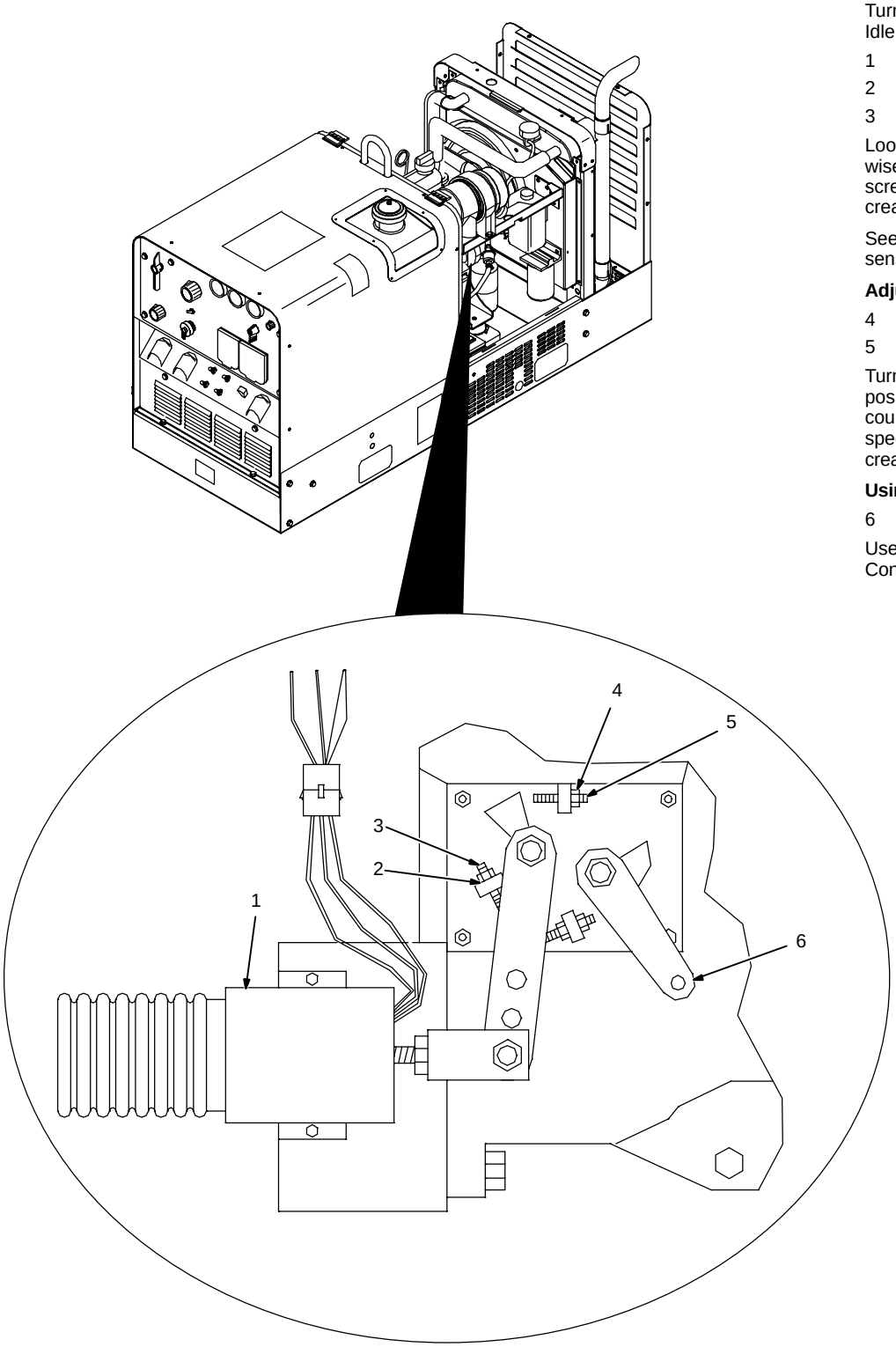
3/16 in

Ref. 802 579-B

7-8. Adjusting Engine Speed



	2500 rpm
	3750 Max



After tuning engine, check engine speeds with a tachometer (see table). If necessary, adjust speeds as follows:

Start engine and run until warm. Turn V/A control to max.

Adjusting Idle Speed

Turn Engine Control switch to Run/Idle position.

1 Throttle Solenoid

2 Idle Speed Jam Nut

3 Idle Speed Screw

Loosen nut and turn screw clockwise to increase idle speed. Turn screw counterclockwise to decrease idle speed. Tighten nut.

See engine manual for governor sensitivity adjustment.

Adjusting Weld/Power Speed

4 Weld Speed Jam Nut

5 Adjustment Screw

Turn Engine Control switch to Run position. Loosen nut and turn screw counterclockwise to increase speed. Turn screw clockwise to decrease speed. Tighten nut.

Using Engine Stop Lever

6 Engine Stop Lever

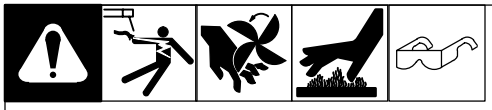
Use lever to stop engine if Engine Control switch does not work.

Tools Needed:

10 mm

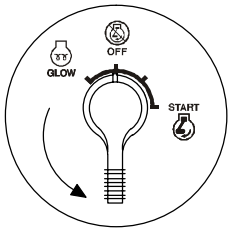
Ref. 802 579-B

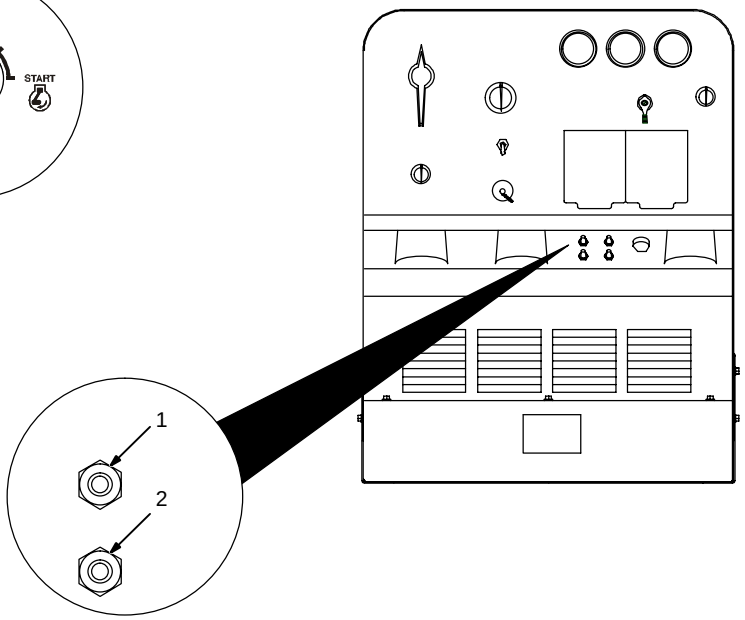
7-9. Overload Protection

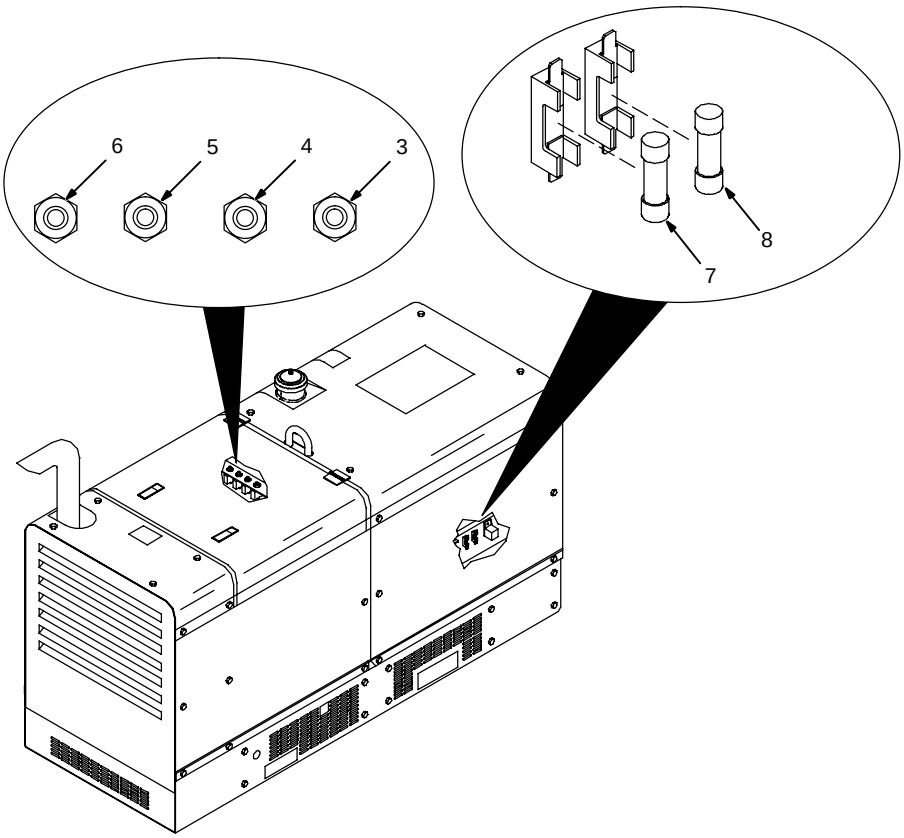


Tools Needed:

3/8 in







▲ **Stop engine.**

☞ *When a circuit breaker opens, it usually indicates a more serious problem exists. Contact Factory Authorized Service Agent.*

1 Circuit Breaker CB5

CB5 protects the 24 volt ac output to Remote 14 receptacle RC1. If CB5 opens, 24 volt ac output to RC1 stops.

2 Circuit Breaker CB6

CB6 protects the 115 volt ac output to Remote 14 receptacle RC1. If CB6 opens, 115 volt ac output to RC1 stops.

Press button to reset breaker.

3 Circuit Breaker CB7

4 Circuit Breaker CB8

5 Circuit Breaker CB9

6 Circuit Breaker CB10

CB7 protects the engine glow plug from overload. If CB7 opens, the glow plug does not work and engine may not start in cold weather. Check continuity and connections of engine glow plug.

CB8 protects the engine wiring system from overload. If CB8 opens, the engine will not crank. Check battery, starter, and engine control switch.

CB9 protects the engine throttle circuit from overload. If CB9 opens, the engine will not run at idle speed. Check throttle solenoid TS1 for obstructions.

CB10 protects the engine fuel solenoid from overload. If CB10 opens, the engine cranks but does not start. Check fuel solenoid FS1 for obstructions.

7 Fuse F1 (See Parts List)

8 Fuse F2 (See Parts List)

Remove side panel.

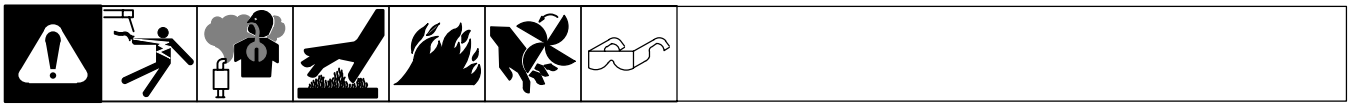
F1 protects the exciter excitation winding from overload. If F1 opens, generator power output stops or is low. Weld output is still available.

F2 protects the stator winding from overload. If F2 opens, weld output stops. Generator power is still available.

Replace any open fuses. Reinstall cover before operating unit.

802 580-A / 802 581

7-10. Troubleshooting



A. Welding

Trouble	Remedy
No weld output; generator power output okay.	Place Process/Contactor switch in a Electrode Hot position, or place switch in a Remote position and connect remote contactor to optional Remote 14 receptacle RC1 (see Section 4-8).
	Check position of polarity switch.
	Reset circuit breaker(s) CB5 and CB6 (see Section 7-9). Check for faulty remote device connected to RC1.
	Check and secure connections to Remote 14 receptacle RC14 (see Section C).
	Have Factory Authorized Service Agent check capacitor board PC4 and connections.
	Check fuse F2, and replace if open (see Section 7-9).
	Have Factory Authorized Service Agent check brushes and slip rings, field excitation circuit, field current control board PC2, and the rotor.
No weld output or generator power output.	Disconnect equipment from generator power receptacles during start-up.
	Check fuses F1 and F2, and replace if open (see Section 7-9).
	Have Factory Authorized Service Agent check brushes and slip rings, integrated rectifier SR2, field excitation circuit, field current control board PC2, and the rotor.
Erratic weld output.	Check control settings.
	Clean and tighten connections both inside and outside unit.
	Be sure connection to work piece is clean and tight.
	Remove excessive coils from weld cables.
	Use dry, properly stored electrodes.
	Check and adjust engine speed (see Section 7-8).
	Check and secure lead connections to remote A/V control.
	Have Factory Authorized Service Agent check brushes, slip rings, and field current control board PC2.
High weld output.	Check position of Voltage/Amperage Adjust control.
	Check engine speed, and adjust if necessary.
	Have Factory Authorized Service Agent check field current regulator board PC2.
Low weld output.	Check engine speed, and adjust if necessary.
	Check fuse F2, and replace if open (see Section 7-9).
	Have Factory Authorized Service Agent check brushes and slip rings, integrated rectifier SR2, field excitation circuit, field current control board PC2, and the rotor.
Low open-circuit voltage.	Check engine speed, and adjust if necessary.
Weld output cannot be adjusted.	Check position of Voltage/Amperage Adjust switch (see Section 5-1).
No power output at Remote 14 receptacle RC1.	Reset circuit breaker CB5 and/or CB6 (see Section 6-1).
No remote fine amperage or voltage control.	Place Voltage/Amperage Adjust switch in Remote position.
	Check and secure connections to Remote 14 receptacle RC1 (see Section 4-8).
	Repair or replace remote control device.

Trouble	Remedy
Min or max CV weld output only.	Check position of Voltage/Amperage Adjustment control and Voltage/Amperage Adjust switch (see Section 5-1).
	Repair or replace remote control device.
	Have Factory Authorized Service Agent check field current regulator board PC2.
Lack of high frequency; difficulty in establishing Gas Tungsten Arc Welding arc.	Use proper size tungsten for welding amperage.
	Reduce leakage of high frequency from torch or work cable (check grounding, remove excessive coils from weld cables, use shorter weld cables, etc.).
	Check cables and torch for cracked or deteriorated insulation or bad connections. Repair or replace necessary parts.
Wandering arc – poor control of arc direction.	Reduce gas flow rate.
	Select proper size tungsten. Properly prepare tungsten.
Tungsten electrode oxidizing and not remaining bright after conclusion of weld.	Shield weld zone from drafts.
	Increase postflow time.
	Check and tighten all gas fittings.
	Properly prepare tungsten.

B. Generator Power

Trouble	Remedy
No generator power output; weld output okay.	Reset circuit breakers CB1, CB3 and/or CB4 (see Section 6-1).
	Check fuse F1, and replace if necessary (see Section 7-9).
	Have Factory Authorized Service Agent check brushes, slip rings, and voltage regulator board PC6.
No generator power or weld output.	Disconnect equipment from generator power receptacles during start-up.
	Check fuses F1 and F2, and replace if necessary (see Section 7-9).
	Have Factory Authorized Service Agent check brushes and slip rings, integrated rectifier SR2, field excitation circuit, field current control board PC2, and the rotor.
Low power output.	Check and clean air cleaner as necessary (see Section 7-4).
	Check and adjust engine speed (see Section 7-8).
	Have Factory Authorized Service Agent check voltage regulator board PC6.
	See engine manual.
High power output.	Check and adjust engine speed (see Section 7-8).
	Have Factory Authorized Service Agent check voltage regulator board PC6.
Erratic power output.	Have Factory Authorized Service Agent check brushes, slip rings, and field current control board PC2.
	Check receptacle wiring and connections.
	Check governor according to engine manual.

C. Engine

Trouble	Remedy
Engine will not crank.	Reset circuit breaker CB8 (see Section 7-9).
	Check battery voltage.
	Check battery connections and tighten if necessary.
	Have Factory Authorized Service Agent check Engine Control switch S1.
Engine cranks, but does not start.	Check fuel level (see Section 4-2).
	Open fuel valve (see Section 4-2).
	Check oil level (see Section 4-2). Engine will not start if oil pressure is low.
	Reset circuit breaker CB10 (see Section 7-9).
	Check coolant level and fan belt (see Section 4-2 and engine manual). Engine will not start if coolant temperature is high.
	Use Glow Plug if unit does not start in cold weather. If unit still does not start, reset circuit breaker CB7 (see Section 7-9).
	Service primary and secondary fuel filters (see Section 7-5).
	Check battery and replace if necessary.
	Check engine charging system according to engine manual.
	Bleed air from fuel system according to engine manual.
	Have Factory Authorized Service Agent check low oil pressure switch S4, engine coolant temperature switch S5, and control relay CR1.
	See engine manual.
Engine starts but stops when Engine Control switch is released.	Check oil level (see Section 4-2). Engine will not start if oil pressure is too low.
	Reset circuit breaker CB10 (see Section 7-9).
	Check coolant level and fan belt (see Section 4-2 and engine manual). Engine will not start if engine temperature is too high.
	Check and refill crankcase with proper viscosity oil for operating temperature, if necessary (see engine manual).
	Have Factory Authorized Service Agent check low oil pressure switch S4 and engine coolant temperature switch S5.
Engine does not stop.	Stop engine by pushing down engine stop lever (see Section 4-2) or closing fuel valve (see Section 4-2). After stopping engine, adjust fuel solenoid linkage (see engine manual).
Engine stopped during normal operation.	Check fuel level (see Section 4-2).
	Open fuel valve (see Section 4-2).
	Check oil level (see Section 4-2). Engine stops if oil pressure is too low.
	Check coolant level and fan belt (see Section 4-2 and engine manual). Engine stops if engine temperature is too high.
	Bleed air from fuel system according to engine manual.
	Have Factory Authorized Service Agent check low oil pressure switch S4 and engine coolant temperature switch S5.
Battery discharges between uses.	Clean top of battery with baking soda and water solution; rinse with clear water.
	Periodically recharge battery (approximately every 3 months).
	Replace battery.
	Check voltage regulator according to engine manual.

Trouble	Remedy
Engine does not go to low (idle) speed with Engine Speed switch in Run/Idle position.	Be sure Engine Speed switch is in Run/Idle position.
	Remove all weld and generator power loads.
	Turn off remote device connected to Remote 14 receptacle RC1 (see Section 4-8).
	Check for obstructed movement of throttle solenoid linkage.
	Have Factory Authorized Service Agent check timer module and current transformer CT1.
	Reset circuit breaker CB9 (see Section 7-9).
Engine does not go to high (run) speed when generator power or large weld load is applied with Engine Speed switch in Run/Idle position.	Place Engine Speed switch in the Run position. Have Factory Authorized Service Agent check unit.
Engine uses oil during run-in period; wetstacking occurs.	Dry engine (see Section 9 and engine manual).
Coolant recovery tank continuously overflows.	Bleed air from radiator, and replace lost coolant (see Section 4-3).

Notes

SECTION 8 – ELECTRICAL DIAGRAMS

⚠ WARNING

ELECTRIC SHOCK HAZARD

- Do not touch live electrical parts.
- Disconnect input power or stop engine before servicing.
- Do not operate with covers removed.
- Have only qualified persons install, use, or service this unit.

S6		Remote			Electrode Hot		
Switch No	Lead No	TIG	Stick	MIG	MIG	Stick	TIG
1-2	112-120	X	X	X			
2-3	98-120				X	X	X
5-6	103-104			X	X		
7-8	127-128	X					X

X=Contact Closed

S2				
	Glow	Off	Run	Start
1	X			X
2			X	X
3				X

X=Closed to "B" Terminal

S7				
Switch No	Lead No	Idle	Run/Idle	Run
1-2	49-72	X		
2-3	72-55		X	
5-6	49-56		X	

X=Contact Closed

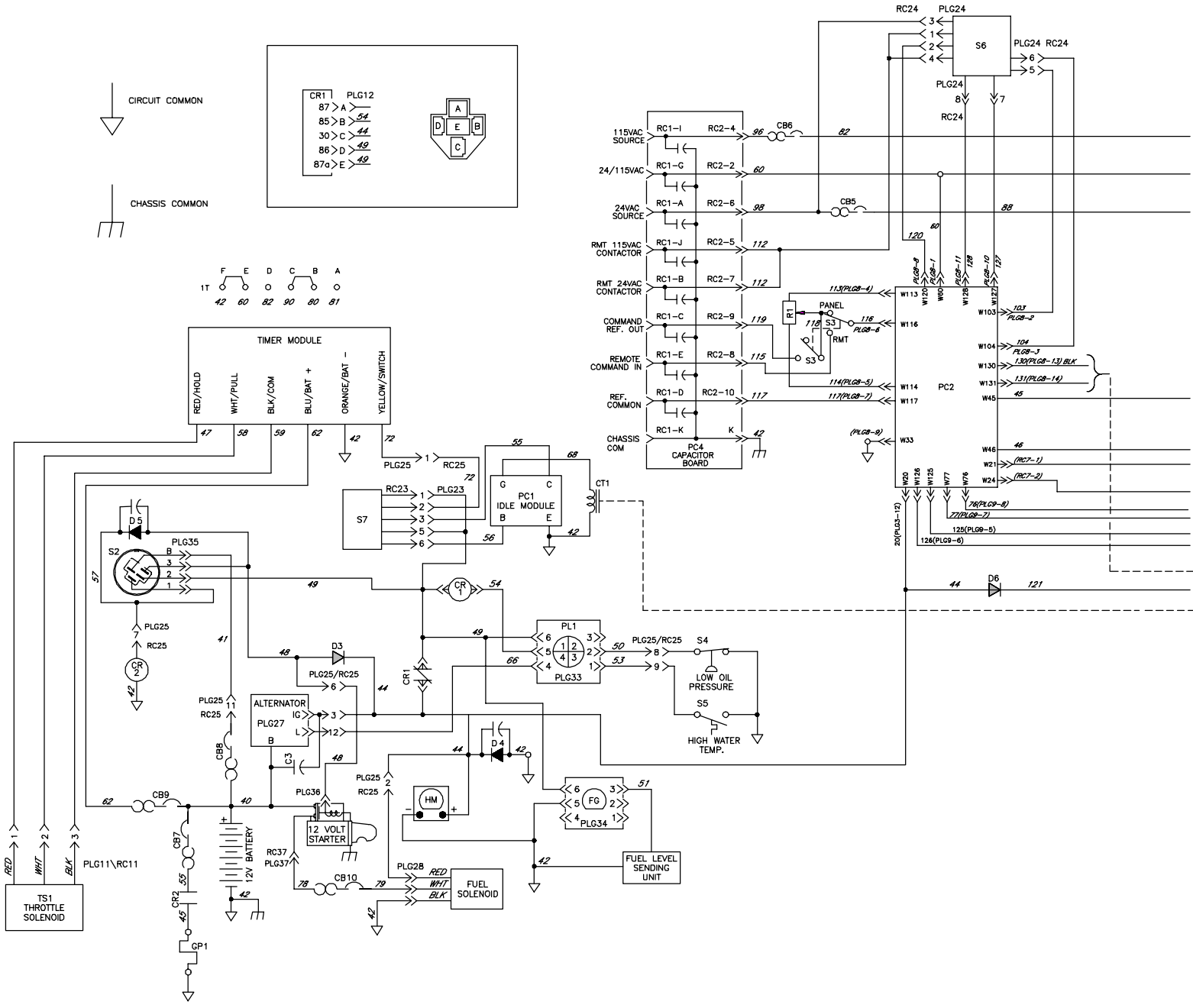
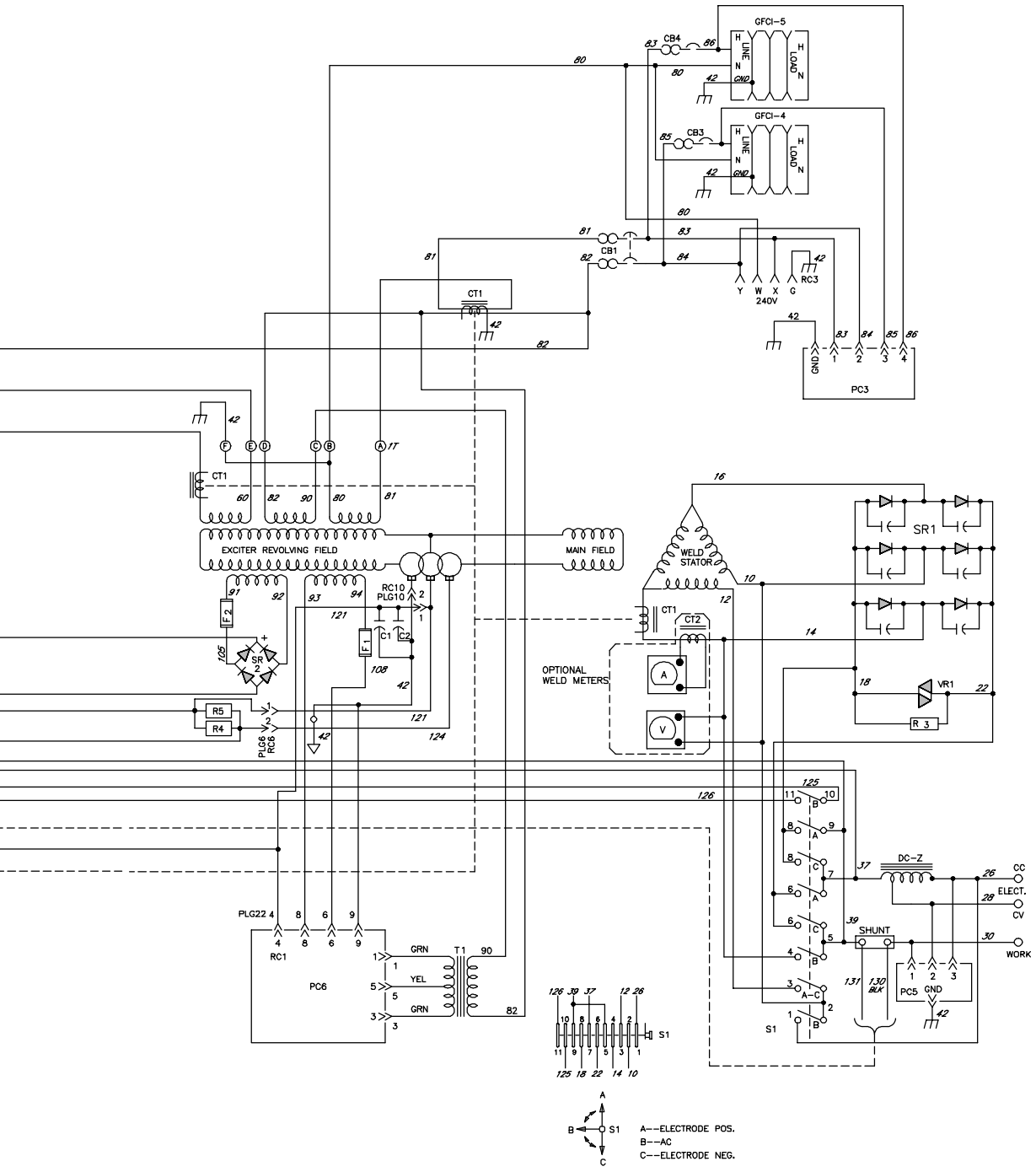
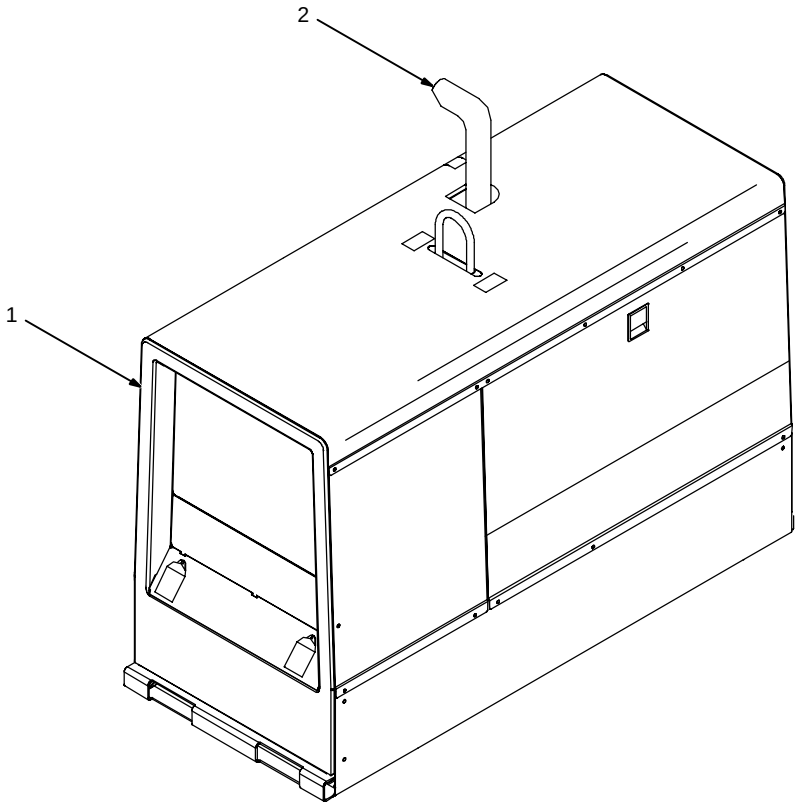


Figure 8-1. Circuit Diagram For Welding Generator


GFCI-5
CB4
GFCI-4
CB3
CB1
CT1
PC3
EXCITER REVOLVING FIELD
MAIN FIELD
WELD STATOR
SR1
SR2
RC10
PLG10
RC6
PLG6
OPTIONAL WELD METERS
VR1
R3
R5
R4
F1
F2
C1
C2
CT2
DC-Z
SHUNT
PC5
GND
PLG22
RC1
PC6
T1
GRN
YEL
S1
A--ELECTRODE POS.
B--AC
C--ELECTRODE NEG.
CC
ELECT.
CV
WORK

SECTION 9 – RUN-IN PROCEDURE

9-1. Wetstacking



▲ **Do not perform run-in procedure at less than 20 volts weld output and do not exceed duty cycle or equipment damage may occur.**

1 Welding Generator

Run diesel engines near rated voltage and current during run-in period to properly seat piston rings and prevent wetstacking. See nameplate, rating label, or specifications section in this manual to find rated voltage and current.

☞ *Do not idle engine longer than necessary. Piston rings seat faster if engine runs at weld/power rpm, and the welding generator is kept loaded during run-in.*

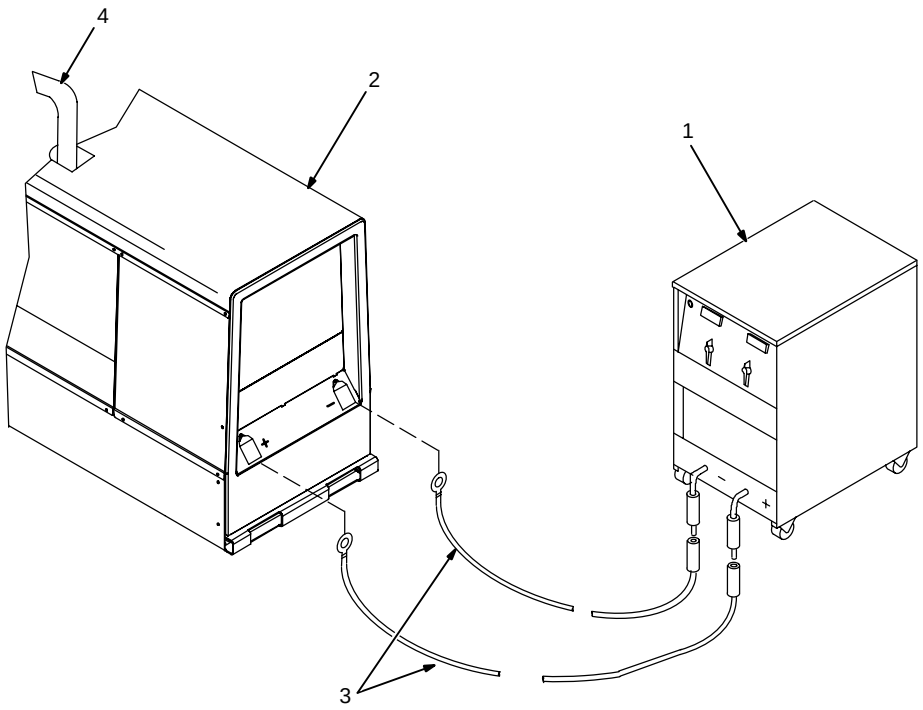
2 Engine Exhaust Pipe

Wetstacking is unburned fuel and oil in the exhaust pipe and occurs during run-in if the engine is run too long at light load or idle rpm.

If exhaust pipe is coated with a wet, black, tar-like substance, dry the engine using one of the following run-in procedures.

See the engine manual for additional engine run-in information.

9-2. Run-In Procedure Using Load Bank



▲ **Stop engine.**

▲ **Do not touch hot exhaust pipe, engine parts, or load bank/grid.**

▲ **Keep exhaust and pipe away from flammables.**

▲ **Do not perform run-in procedure at less than 20 volts weld output and do not exceed duty cycle or equipment damage may occur.**

1 Load Bank

Turn all load bank switches Off. If needed, connect load bank to 115 volts ac wall receptacle or generator auxiliary power receptacle.

2 Welding Generator

3 Weld Cables

Connect load bank to generator weld output terminals using proper size weld cables with correct connectors. Observe correct polarity.

Start engine and run for several minutes.

Set load bank switches and then adjust generator V/A control so load equals 225 amps at 30 volts.

Check generator and load bank meters after first five minutes then every fifteen minutes to be sure generator is loaded properly.

☞ *Check oil level frequently during run-in; add oil if needed.*

After one hour (minimum) place V/A control in minimum position, then turn off load bank to remove load. Run engine several minutes at no load.

▲ **Stop engine and let cool.**

4 Engine Exhaust Pipe

Repeat procedure if wetstacking is present.

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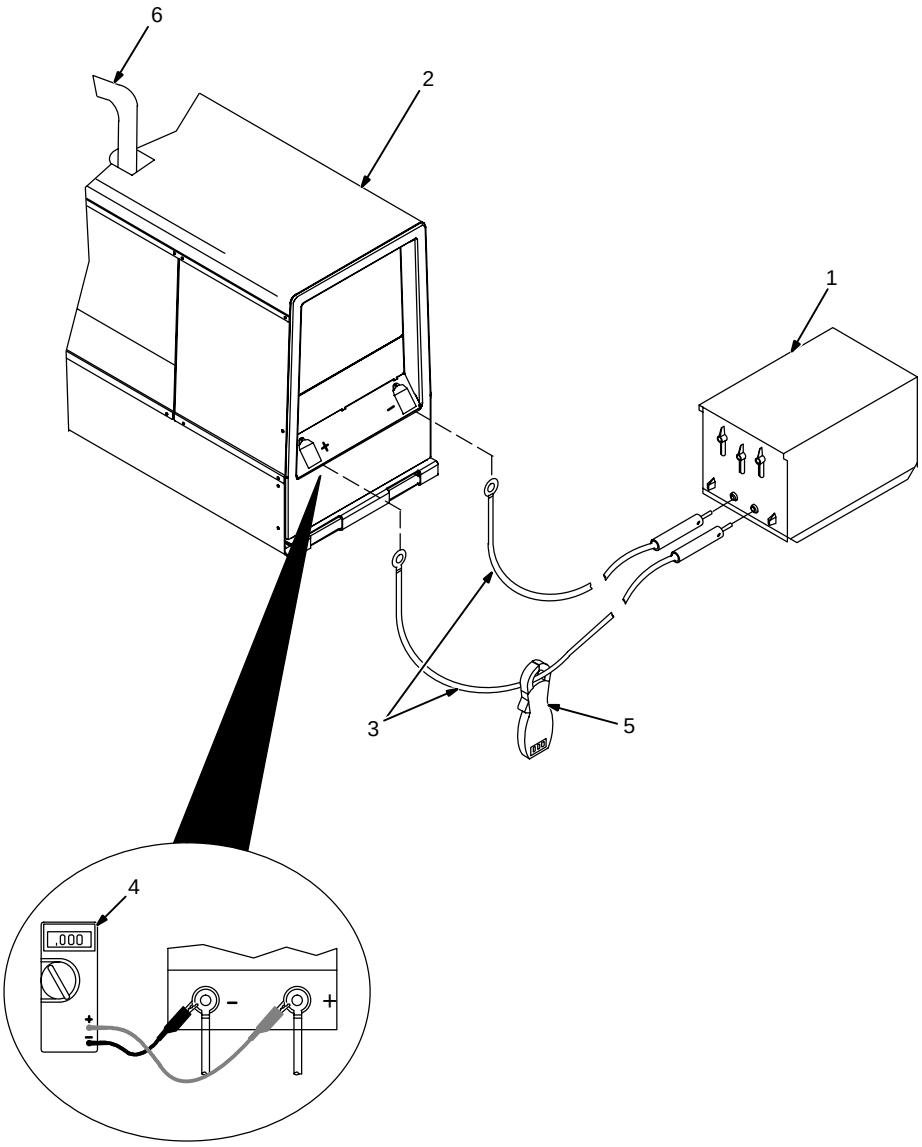
9-3. Run-In Procedure Using Resistance Grid



▲ **Stop engine.**

▲ **Do not touch hot exhaust pipe, engine parts, or load bank/grid.**

▲ **Keep exhaust and pipe away from flammables.**

▲ **Do not perform run-in procedure at less than 20 volts weld output and do not exceed duty cycle or equipment damage may occur.**

1 Resistance Grid

Use grid sized for generator rated output.

Turn Off grid.

2 Welding Generator

3 Weld Cables

Connect grid to generator weld output terminals using proper size weld cables with correct connectors (polarity is not important).

4 Voltmeter

5 Clamp-On Ammeter

Connect voltmeter and ammeter as shown, if not provided on generator.

Start engine and run for several minutes.

Set grid switches and then adjust generator V/A control so load equals 225 amps at 30 volts.

Check generator and meters after first five minutes then every fifteen minutes to be sure generator is loaded properly.

☞ *Check oil level frequently during run-in; add oil if needed.*

After one hour (minimum), place V/A control in minimum position, then shut down grid to remove load. Run engine several minutes at no load.

▲ **Stop engine and let cool.**

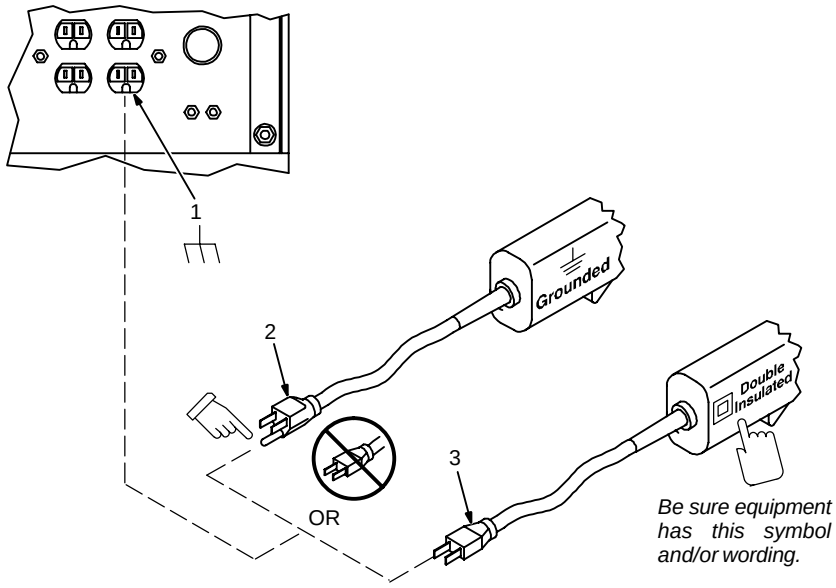
6 Engine Exhaust Pipe

Repeat procedure if wetstacking is present.

S-0684

SECTION 10 – GENERATOR POWER GUIDELINES

10-1. Selecting Equipment



Be sure equipment has this symbol and/or wording.

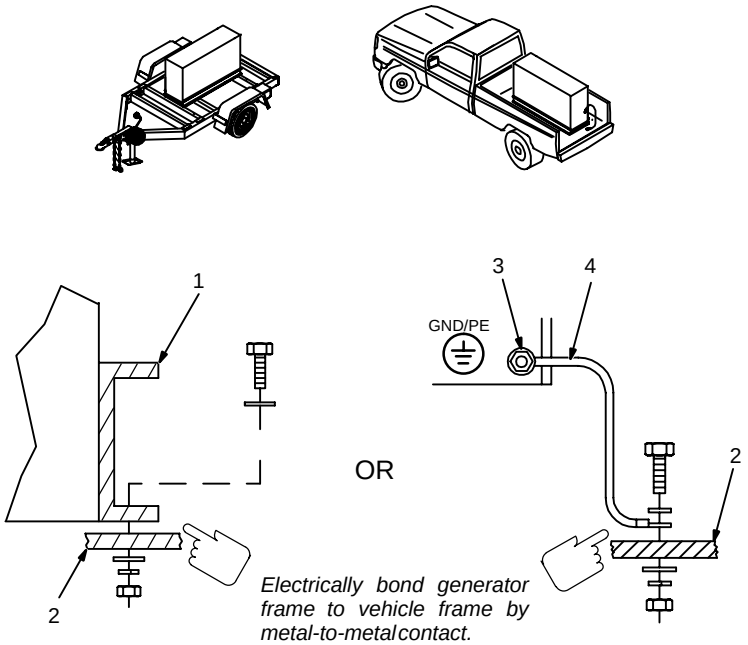
1 Generator Power Receptacles – Neutral Bonded To Frame

2 3-Prong Plug From Case Grounded Equipment

3 2-Prong Plug From Double Insulated Equipment

aux_pwr 4/02 – Ref. ST-159 730 / ST-800 577

10-2. Grounding Generator To Truck Or Trailer Frame



Electrically bond generator frame to vehicle frame by metal-to-metal contact.

▲ **Always ground generator frame to vehicle frame to prevent electric shock and static electricity hazards.**

1 Generator Base

2 Metal Vehicle Frame

3 Equipment Grounding Terminal

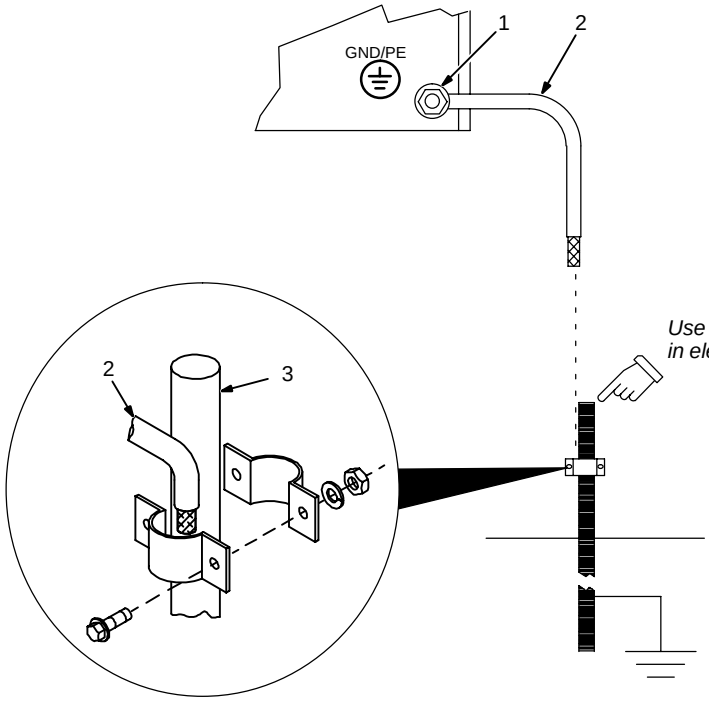
4 Grounding Cable

Use #10 AWG or larger insulated copper wire.

▲ **If unit does not have GFCI receptacles, use GFCI-protected extension cord.**

S-0854

10-3. Grounding When Supplying Building Systems



1 Equipment Grounding Terminal

2 Grounding Cable

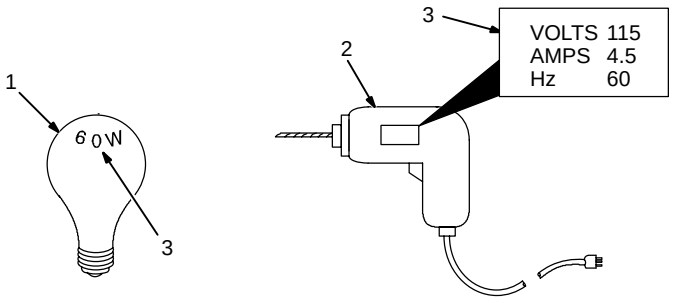
Use #10 AWG or larger insulated copper wire.

3 Ground Device

▲ **Ground generator to system earth ground if supplying power to a premises (home, shop, farm) wiring system.**

ST-800 576-B

10-4. How Much Power Does Equipment Require?



1 Resistive Load

A light bulb is a resistive load and requires a constant amount of power.

2 Non-Resistive Load

Equipment with a motor is a non-resistive load and requires approximately six times more power while starting the motor than when running (see Section 10-8).

3 Rating Data

Rating shows volts and amperes, or watts required to run equipment.

AMPERES x VOLTS = WATTS

EXAMPLE 1: If a drill uses 4.5 amperes at 115 volts, calculate its running power requirement in watts.

4.5 A x 115 V = 520 W

The load applied by the drill is 520 watts.

EXAMPLE 2: If three 200 watt flood lamps are used with the drill from Example 1, add the individual loads to calculate total load.

(200 W + 200 W + 200 W) + 520 W = 1120 W

The total load applied by the three flood lamps and drill is 1120 watts.

S-0623

10-5. Approximate Power Requirements For Industrial Motors

Industrial Motors	Rating	Starting Watts	Running Watts
Split Phase	1/8 HP	800	300
	1/6 HP	1225	500
	1/4 HP	1600	600
	1/3 HP	2100	700
	1/2 HP	3175	875
Capacitor Start-Induction Run	1/3 HP	2020	720
	1/2 HP	3075	975
	3/4 HP	4500	1400
	1 HP	6100	1600
	1-1/2 HP	8200	2200
	2 HP	10550	2850
	3 HP	15900	3900
	5 HP	23300	6800
Capacitor Start-Capacitor Run	1-1/2 HP	8100	2000
	5 HP	23300	6000
	7-1/2 HP	35000	8000
	10 HP	46700	10700
Fan Duty	1/8 HP	1000	400
	1/6 HP	1400	550
	1/4 HP	1850	650
	1/3 HP	2400	800
	1/2 HP	3500	1100

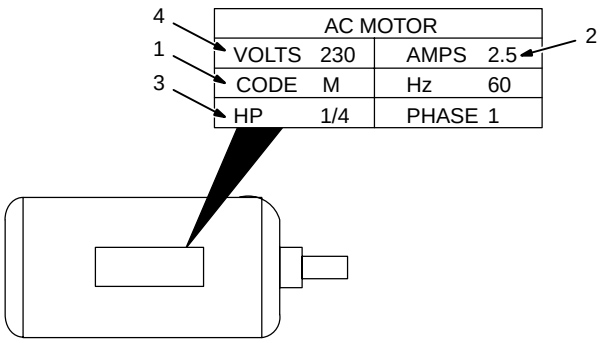
10-6. Approximate Power Requirements For Farm/Home Equipment

Farm/Home Equipment	Rating	Starting Watts	Running Watts
Stock Tank De-Icer		1000	1000
Grain Cleaner	1/4 HP	1650	650
Portable Conveyor	1/2 HP	3400	1000
Grain Elevator	3/4 HP	4400	1400
Milk Cooler		2900	1100
Milker (Vacuum Pump)	2 HP	10500	2800
FARM DUTY MOTORS	1/3 HP	1720	720
Std. (e.g. Conveyors,	1/2 HP	2575	975
Feed Augers, Air	3/4 HP	4500	1400
Compressors)	1 HP	6100	1600
	1-1/2 HP	8200	2200
	2 HP	10550	2850
	3 HP	15900	3900
	5 HP	23300	6800
High Torque (e.g. Barn	1-1/2 HP	8100	2000
Cleaners, Silo Unloaders,	5 HP	23300	6000
Silo Hoists, Bunk Feeders)	7-1/2 HP	35000	8000
	10 HP	46700	10700
3-1/2 cu. ft. Mixer	1/2 HP	3300	1000
High Pressure 1.8 Gal/Min	500 PSI	3150	950
Washer 2 gal/min	550 PSI	4500	1400
2 gal/min	700 PSI	6100	1600
Refrigerator or Freezer		3100	800
Shallow Well Pump	1/3 HP	2150	750
	1/2 HP	3100	1000
Sump Pump	1/3 HP	2100	800
	1/2 HP	3200	1050

10-7. Approximate Power Requirements For Contractor Equipment

Contractor	Rating	Starting Watts	Running Watts
Hand Drill	1/4 in	350	350
	3/8 in	400	400
	1/2 in	600	600
Circular Saw	6-1/2 in	500	500
	7-1/4 in	900	900
	8-1/4 in	1400	1400
Table Saw	9 in	4500	1500
	10 in	6300	1800
Band Saw	14 in	2500	1100
Bench Grinder	6 in	1720	720
	8 in	3900	1400
	10 in	5200	1600
Air Compressor	1/2 HP	3000	1000
	1 HP	6000	1500
	1-1/2 HP	8200	2200
	2 HP	10500	2800
Electric Chain Saw	1-1/2 HP, 12 in	1100	1100
	2 HP, 14 in	1100	1100
Electric Trimmer	Standard 9 in	350	350
	Heavy Duty 12 in	500	500
Electric Cultivator	1/3 HP	2100	700
Elec. Hedge Trimmer	18 in	400	400
Flood Lights	HID	125	100
	Metal Halide	313	250
	Mercury	1000	
	Sodium	1400	
	Vapor	1250	1000
Submersible Pump	400 gph	600	200
Centrifugal Pump	900 gph	900	500
Floor Polisher	3/4 HP, 16 in	4500	1400
	1 HP, 20 in	6100	1600
High Pressure Washer	1/2 HP	3150	950
	3/4 HP	4500	1400
	1 HP	6100	1600
55 gal Drum Mixer	1/4 HP	1900	700
Wet & Dry Vac	1.7 HP	900	900
	2-1/2 HP	1300	1300

10-8. Power Required To Start Motor



1 Motor Start Code
2 Running Amperage
3 Motor HP
4 Motor Voltage

To find starting amperage:

Step 1: Find code and use table to find kVA/HP. If code is not listed, multiply running amperage by six to find starting amperage.

Step 2: Find Motor HP and Volts.

Step 3: Determine starting amperage (see example).

Welding generator amperage output must be at least twice the motor's running amperage.

Single-Phase Induction Motor Starting Requirements

Motor Start Code	G	H	J	K	L	M	N	P
KVA/HP	6.3	7.1	8.0	9.0	10.0	11.2	12.5	14.0

$$\frac{\textbf{kVA/HP x HP x 1000}}{\textbf{VOLTS}} = \textbf{STARTING AMPERAGE}$$

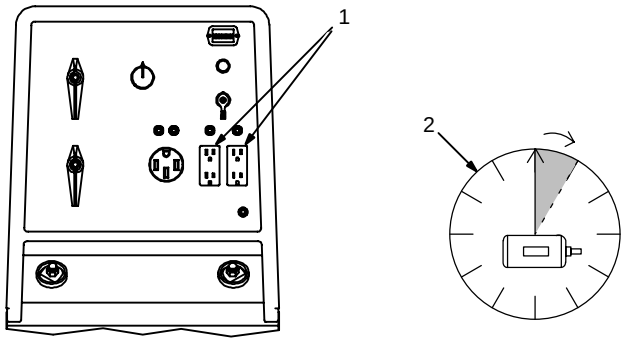
EXAMPLE: Calculate the starting amperage required for a 230 V, 1/4 HP motor with a motor start code of M.

Volts = 230 HP = 1/4 Using Table, Code M results in kVA/HP = 11.2

$$\frac{11.2 \times 1/4 \times 1000}{230} = 12.2\ \text{A}$$ **Starting the motor requires 12.2 amperes.**

S-0624

10-9. How Much Power Can Generator Supply?



1 Limit Load To 90% Of Generator Output

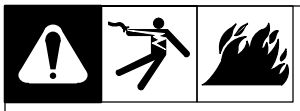
Always start non-resistive (motor) loads in order from largest to smallest, and add resistive loads last.

2 5 Second Rule

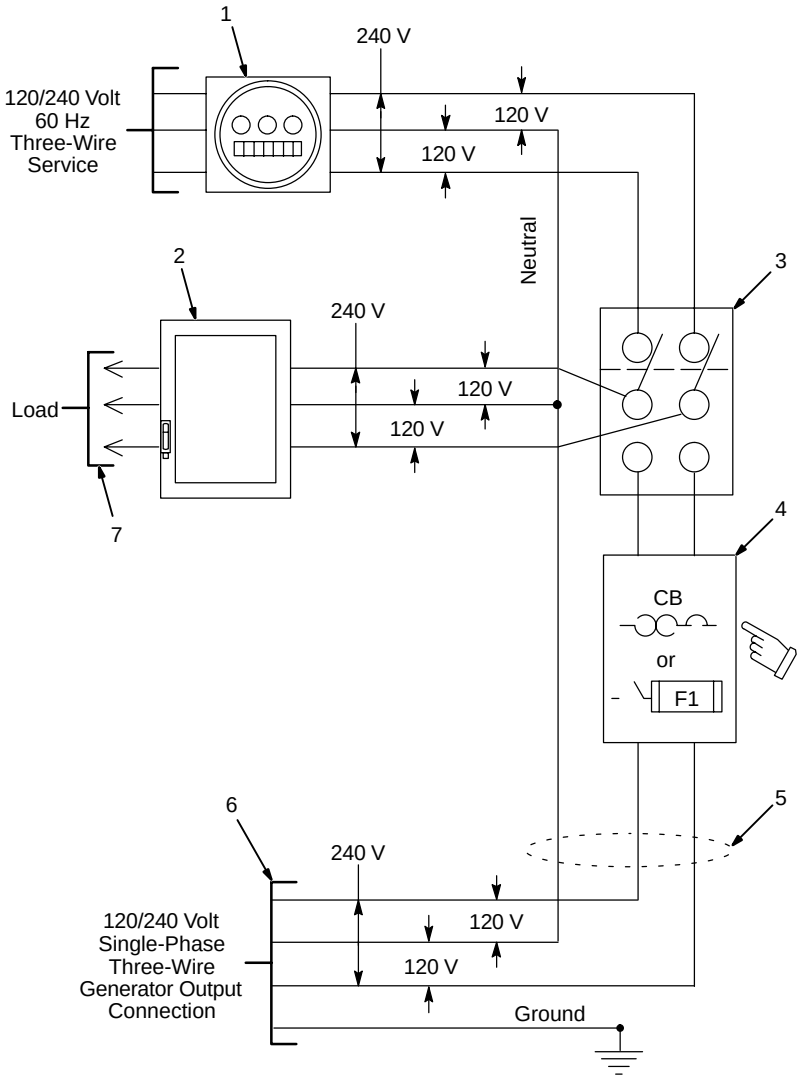
If motor does not start within 5 seconds, turn off power to prevent motor damage. Motor requires more power than generator can supply.

Ref. ST-800 396-A / S-0625

10-10. Typical Connections To Supply Standby Power



☞ *Customer-supplied equipment is required if generator is to supply standby power during emergencies or power outages.*



Item 4 is not necessary if circuit protection is already present in generator power circuit.

▲ **Have only qualified persons perform these connections according to all applicable codes and safety practices.**

1 Power Company Service Meter

2 Main and Branch Overcurrent Protection

3 Double-Pole, Double-Throw Transfer Switch

Obtain and install correct switch. Switch rating must be same as or greater than the branch overcurrent protection.

4 Circuit Breakers or Fused Disconnect Switch

Obtain and install correct circuit breakers or switch.

5 Extension Cord

Select as shown in Section 10-11.

6 Generator Connections

Connect terminals or plug of adequate amperage capacity to cord. Follow all applicable codes and safety practices.

Turn off or unplug all equipment connected to generator before starting or stopping engine. When starting or stopping, the engine has low speed which causes low voltage and frequency.

7 Load Connections

S-0405-A

10-11. Selecting Extension Cord (Use Shortest Cord Possible)

Cord Lengths for 120 Volt Loads

▲ **If unit does not have GFCI receptacles, use GFCI-protected extension cord.**

Current (Amperes)	Load (Watts)	Maximum Allowable Cord Length in ft (m) for Conductor Size (AWG)*					
		4	6	8	10	12	14
5	600			350 (106)	225 (68)	137 (42)	100 (30)
7	840		400 (122)	250 (76)	150 (46)	100 (30)	62 (19)
10	1200	400 (122)	275 (84)	175 (53)	112 (34)	62 (19)	50 (15)
15	1800	300 (91)	175 (53)	112 (34)	75 (23)	37 (11)	30 (9)
20	2400	225 (68)	137 (42)	87 (26)	50 (15)	30 (9)	
25	3000	175 (53)	112 (34)	62 (19)	37 (11)		
30	3600	150 (46)	87 (26)	50 (15)	37 (11)		
35	4200	125 (38)	75 (23)	50 (15)			
40	4800	112 (34)	62 (19)	37 (11)			
45	5400	100 (30)	62 (19)				
50	6000	87 (26)	50 (15)				

*Conductor size is based on maximum 2% voltage drop

Cord Lengths for 240 Volt Loads

▲ **If unit does not have GFCI receptacles, use GFCI-protected extension cord.**

Current (Amperes)	Load (Watts)	Maximum Allowable Cord Length in ft (m) for Conductor Size (AWG)*					
		4	6	8	10	12	14
5	1200			700 (213)	450 (137)	225 (84)	200 (61)
7	1680		800 (244)	500 (152)	300 (91)	200 (61)	125 (38)
10	2400	800 (244)	550 (168)	350 (107)	225 (69)	125 (38)	100 (31)
15	3600	600 (183)	350 (107)	225 (69)	150 (46)	75 (23)	60 (18)
20	4800	450 (137)	275 (84)	175 (53)	100 (31)	60 (18)	
25	6000	350 (107)	225 (69)	125 (38)	75 (23)		
30	7000	300 (91)	175 (53)	100 (31)	75 (23)		
35	8400	250 (76)	150 (46)	100 (31)			
40	9600	225 (69)	125 (38)	75 (23)			
45	10,800	200 (61)	125 (38)				
50	12,000	175 (53)	100 (31)				

*Conductor size is based on maximum 2% voltage drop

SECTION 11 – PARTS LIST

☞ *Hardware is common and not available unless listed.*

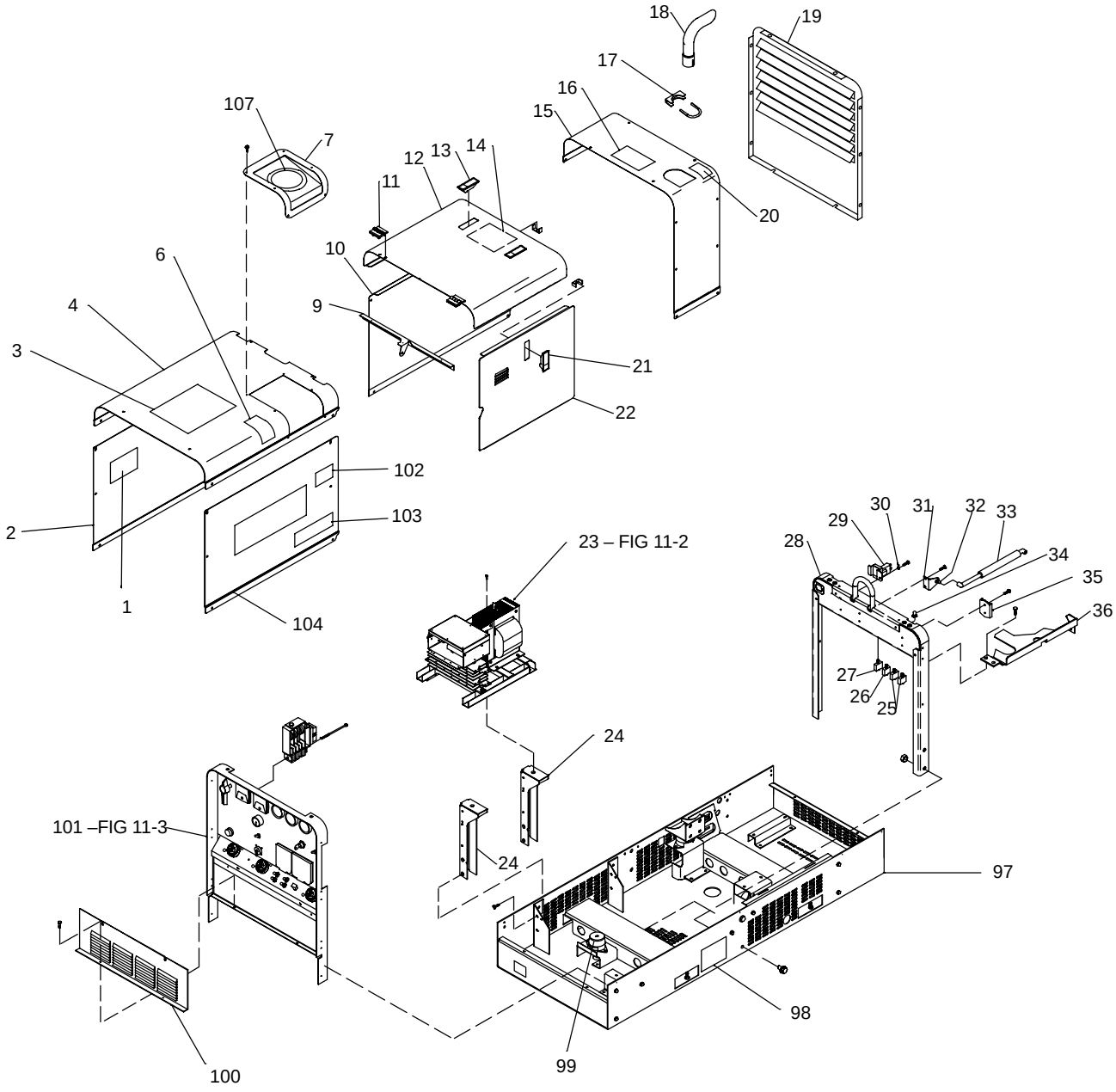
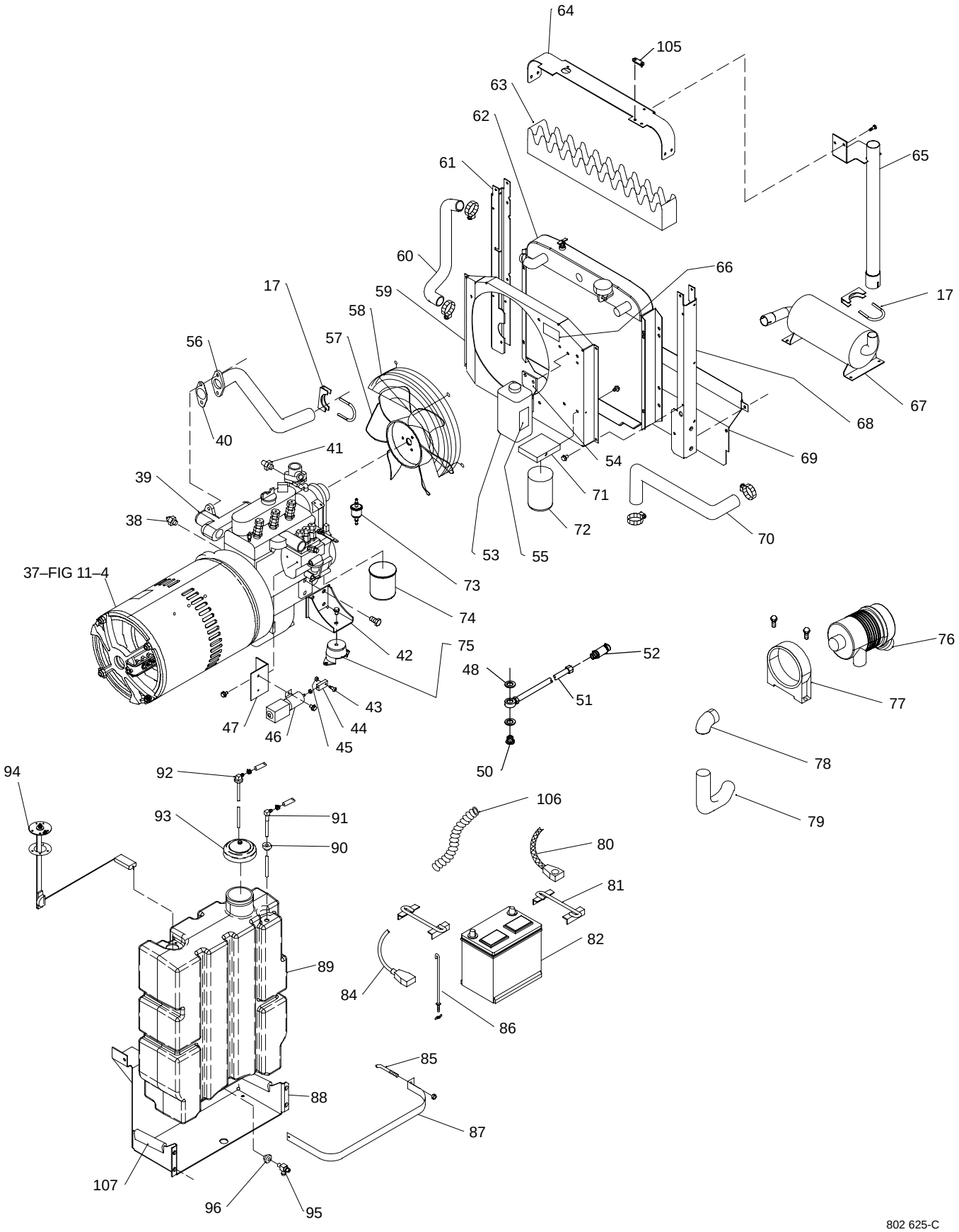


Figure 11-1. Main Assembly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37–FIG 11–4
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802 625-C

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 11-1. Main Assembly

1		013367	Label, Warning Moving Parts Can Cause Serious Etc	1
2		+198157	Panel, Generator Left	1
2		♦+198873	Panel, Generator Left Stainless Steel	1
3		200795	Label, Warning General Precautionary Engine Drive	1
4		+198155	Cover, Generator	1
4		♦+198871	Cover, Generator Stainless Steel	1
		♦163163	Screw, 250–20x .50 Hex Hd–pln Stainless Steel Pln T18–8 302–305	37
		♦163175	Screw, 250–20x .75 Hex Hd–pln Stainless Steel Pln T18–8 302–305	As Rqd
		♦163167	Washer, Lock .254idx0.489odx.062t Stainless Steel Split.250	37
		♦163174	Washer, Flat .281idx0.625odx.050t Stainless Steel	37
5		Deleted		
6		192041	Label, Use Diesel Fuel Only	1
7		198159	Tray, fuel spill	1
8		Deleted		
9		193411	Brace, Hood Access Rear	1
10		+198156	Panel, Access	1
10		♦+198872	Panel, Access Stainless Steel	1
11		198525	Hinge, Door Access 180 Deg.	2
12		+198164	Hood, Access	1
12		♦+198878	Hood, Access Stainless Steel	1
13		194320	Latch, Lever Flush Trigger	2
14		194295	Label, Diesel Engine Maintenance Kubota 905/1005	1
15		+198162	Plenum, Radiator Cover	1
15		♦+198875	Plenum, Radiator Cover Stainless Steel	1
16		191623	Label, Warning All Panels Must Be In Place While Ru	1
17		109591	Clamp, Muffler 1.750 Dia U Pld	3
18		201 882	Pipe, Exhaust Elbow 1.654 ID Stainless	1
19		198153	Panel, Rear	1
20		176230	Label, Hot Exhaust Parts Do Not Touch	1
21		194320	Latch, Lever Flush Trigger	1
22		+198154	Door, Access Removable	1
22		♦+198870	Door, Access Removable Stainless Steel	1
23		Figure 11-2	Mounting bracket w/components	1
24		198167	Support, Weld Components	2
		198539	Harness, Wrg Engine Compartment (consisting of)	1
25	CB9,10	139266	Circuit Breaker, Man Reset 1p 15a 250vac Frict	2
26	CB8	115427	Circuit Breaker, Man Reset 1p 25a 250vac Frict	1
27	CB7	147658	Circuit Breaker, Man Reset 1p 30a 250vac Screw	1
	C3	199451	Alternator Filter/Capacitor Assembly	1
	RC25	166679	Conn, Rect Univ 084 12p/S 3row Rcpt Cable/Panel Lkg (service kit)	1
	PLG27	192170	Conn, Rect 250 2skt 2row Plug Cable Lkg	1
	PLG36	192169	Conn, Rect 250 1skt 1row Plug Cable Lkg	1
	PLG28	192171	Conn, Rect 250 3skt 2row Plug Cable Lkg	1
	PLG37	192168	Conn, Rect 250 1pin 1row Rcpt Cable Lkg	1
	PLG11	130204	Conn, Rect Univ 084 3p/S 1row Plug Cable Lkg (service kit)	1
		192167	Seal,Wire Univ 3p/S 1row	1
		187654	Seal, Wire Univ 12p/S 3row	1
28		198054	Upright, Base Center	1
		209344	Seal, Lifting Eye	1
29	CR2	155309	Contactor, Solenoid 12vdc Continuous 400a Inrush	1
30		010381	Connector	1
31		193414	Bracket, Mtg Gas Spring Front	1
32		172296	Ball Gas Spring, Stud .39 Dia	2
33		192239	Spring, Pressure Gas	1
34		206 795	Boot, Circuit Breaker Clear Hex Nut	4
35	TIMER MODULE	198882	Module, Solenoid Control W/Terminals	1
36		197265	Bracket, Mtg Air Cleaner	1
37		Figure 11-4	Generator Assembly	1
38	S4	*197145	Switch, Pressure Oil 7psi No Screw Term	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 11-1. Main Assembly (Continued)

39		193624	Engine, Kubota Dsl Elec Dh905b–1 (Consisting Of)	1
40		192517	Gasket, Exhaust Manifold	1
41	S5	*205 800	Switch, Thermo Temp 230deg +/–5deg F No	1
42		192475	Support, Engine	2
43		118829	Screw, Shld Stl Sch .312–18 X .500 X .375 Shld	1
44		194127	Linkage, Throttle Solenoid	1
45		145675	Nut, 312–18 .50hex .37h Stl Pld Deformed Lkg Thrd	1
46	TS1	192196	Solenoid, 12vdc 46a Push/Hold W/Amp Connect & Seal	1
47		192663	Bracket, Mtg Solenoid	1
48		047235	Washer, Seal Oil Copper .879id X 1.059od 111–8737	2
49		Deleted		
50		047234	Banjo Bolt,	1
51		203 897	Hose, Oil W/Fittings 22.500 Lg	1
52		165271	Valve, Oil Drain 3/8–18 Nptf	1
			Adapter, Engine (see Figure 11-4)	1
53		+187462	Bottle, overflow w/cap & hose (consisting of)	1
		208 124	Cap,W/Gasket Overflow Bottle	1
54		192934	Bracket, mtg coolant recovery tank	1
		114923	Boot, Insulator Term Post Red (for starter and alternator terminals)	2
55		197671	Label, Coolant Level	1
56		192194	Pipe, Exhaust Flexible Inlet W/Insulation	1
57		197146	Fan, Engine 330mm Pusher Kubota	1
		*197197	Belt, Fan Kubota 905	1
58		+191693	Guard, Fan	1
59		202 243	Shroud, Fan	1
60		191341	Hose, Radiator Outlet	1
61		198186	Bracket, Mtg Radiator Lh	1
62		197822	Radiator, w/14# Cap 3 Row Core 1.125 Inlet/Outlet	1
		187120	Cap, radiator pressure 14 lb	1
63		194578	Baffle, Foam Air	1
64		198181	Radiator Arch	1
65		192195	Pipe, Exhaust Outlet 1.625 Od	1
66		182092	Label, Warning Moving Parts Can Cause Serious Injur	1
67		201528	Muffler, Exhaust Engine Kubota Dh905b–1	1
68		198187	Bracket, Mtg Radiator Rh	1
69		198185	Baffle, Lower Radiator	1
70		191342	Hose, Radiator Inlet	1
71		202198	Base, Fuel Filter	1
72		*192744	Filter, Fuel Spin–on	1
73		*066113	Filter, Fuel Inline .250	1
74		*196428	Filter, Oil Kubota 905dh/1005dh	1
75		192476	Mount, Engine Vibration	2
76		192188	Air Cleaner, Intake 90deg Outlet 4.25in Dia.	1
		*187441	Element, Air Cleaner	1
		♦202102	Element, Air Cleaner Safety	1
77		193026	Band, Mtg Air Cleaner Case	1
78		197256	Hose, Elbow Air Intake	1
79		197227	Hose, Elbow Air Cleaner 1.750id	1
80		032453	Cable, Bat Neg 24.375 No 2 Awg W/Clamp & .375 Rng	1
81		204 875	Hold Down, Battery	1
82	BATT	146237	Battery, Stor 12v 535 Crk 90 Rsv Gp 55 Maint Free	1
		108081	Terminal Protector, Battery Post Mtg	2
83		Deleted		
84		182276	Cable, Bat Pos 28.000 No 1 Awg W/Clamp & .406 Rng	1
85		097829	Bolt, J Stl .250–20 X 2.750 Pld	1
86		494 604	Bolt, j stl .250–20 x 8.000 pld w/nuts&washers	2
87		200 407	Strap, Fuel Tank	1
88		198168	Support, Fuel Tank/Weld Components	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 11-1. Main Assembly (Continued)

. . 89		198180	. . Tank, Fuel 13.1 Gal (Consisting Of)	1
. . 90		124253	. . . . Bushing, Tank Fuel	2
. . 91		198510	. . . . Ftg, Stand Pipe Hose .3125 X24.570lg 90 Deg Zinc	1
. . 92		198511	. . . . Ftg, Stand Pipe Hose .1875x24.570lg 90 Deg Zinc	1
. . 93		190198	. . . . Cap, Tank Screw–on 3.500 In W/Vent	1
. . 94		198512	. . . . Sender, Fuel Gauge 22.500 Deep Tank	1
. . 95		189908	. . . . Valve, Drain Fuel 180 Deg Zinc Pld	1
. . 96		181572	. . . . Bushing, Tank Fuel	1
. . 97		+197835	. . Base	1
. . 98		197930	. . Label, Warning Do Not Weld On Base	2
. . 99		192477	. . Mount, Generator Vibration	1
. 100		199701	. . Panel, Front Access	1
. 101		Figure 11-3	. . Front Panel Assembly	1
. 102		090281	. . Label, Caution Do Not Use Ether – Use Glow Plugs Et	1
. 103		168385	. . Label, Warning Battery Explosion Can Blind	1
. 104		+198158	. . Panel, Generator Right	1
. 104		♦+198874	. . Panel, Generator Right Stainless Steel	1
. 105		191 626	. . Bumper, door access	2
. 106		110 465	. . Tubing, corrugated plastic slit .500 dia xcoil	2.1 ft
. 107		200 366	. . Edge Trim, style 70–p–11 nitrile rubber x roll	2 ft
		194126	. . Kit, Acoustical Foam Noise Reduction	1
		168864	. . Seal, Rubber D .375 High X .750 Wide (door/panel seal)	2.896 ft

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

♦Optional

*Recommended Spare Parts.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

☞ *Hardware is common and not available unless listed.*

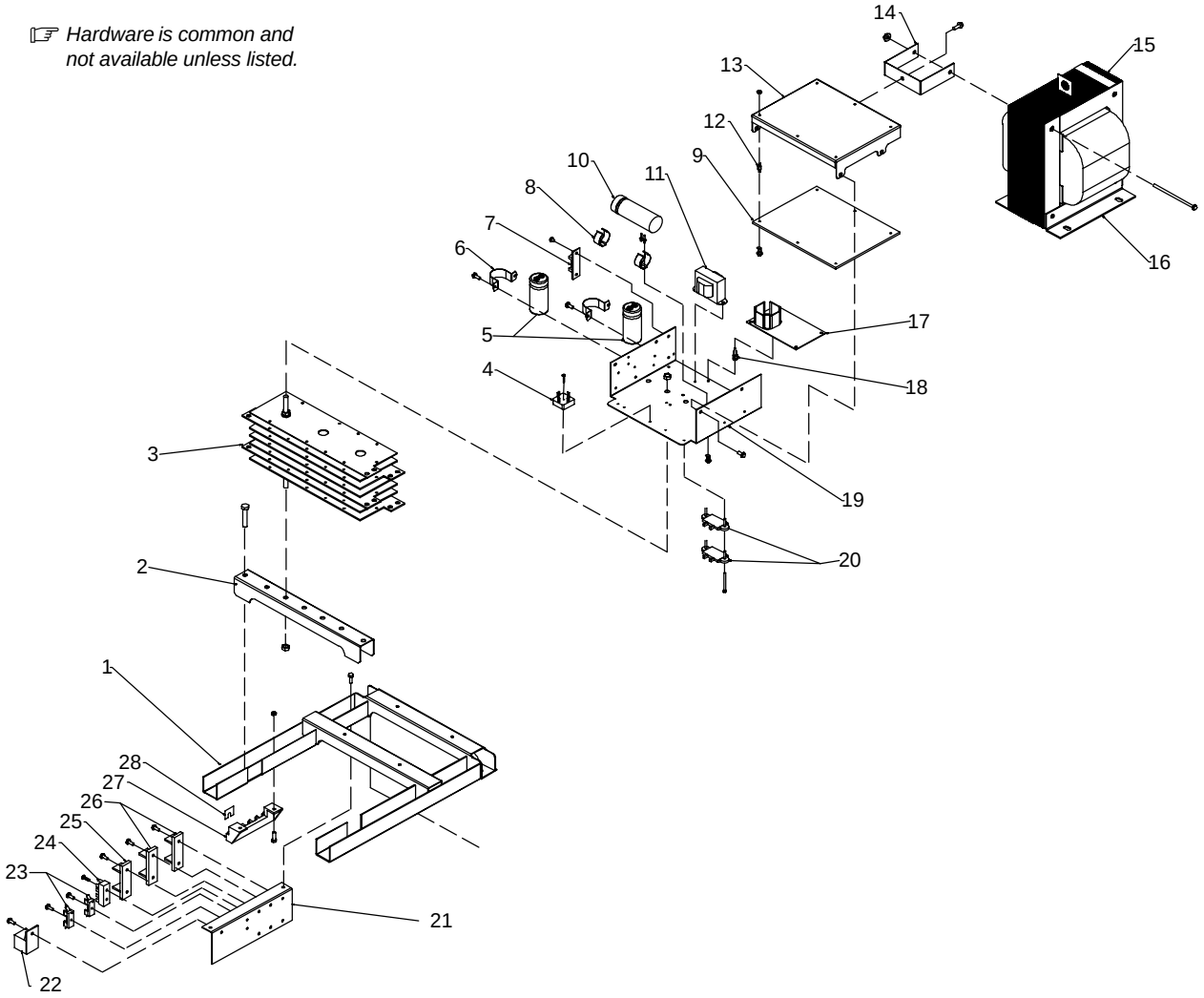

Figure 11-2. Mounting Bracket w/Components

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 11-2. Mounting Bracket w/Components (Figure 11-1, Item 23)	
1		198171	Frame, Mtg Stab/Rect	1
2		198174	Bracket, Mtg Rectifier	1
3	SR1	198514	Rectifier, Si 3ph 350 Amp 400 Piv 100% Duty Cycle	1
4	SR2	035704	Rectifier, Integ Bridge 40. Amp 800v	1
5	C1, C2	087110	Capacitor, Elctlt 240 Uf 200 Vdc Can 1.39 Di	2
6		177136	Clamp, Capacitor 1.375 Dia	2
7	D6	135184	Diode Board,	1
8		176199	Clamp, Capacitor 1.375 Dia Clip	2
9	PC2	202 013	Circuit Card Assy, Field Current Controller (consisting of)	1
10		176007	Capacitor, Elctlt 1200 Uf 300 Vdc Can 1.37 Dia	1
11	T1	035759	Xfmr, Control Mintr 115/36 Vct	1
12		070026	Stand–off, No 6–32 X .437 Lg .250 Hex Al Fem	6
13		198177	Bracket, Mtg Control Board	1
14		199037	Bracket, Support Control Board Tray	1
15	DC-Z	198944	Stabilizer,	1
16		192303	Angle, Mtg Stabilizer	2
17	PC6	199517	Circuit Card Assy, Voltage Regulator	1
18		176478	Stand–off Support, Pc Card No 6 Screw W/Post&lock M	4
19		198178	Tray, Control Board	1
20	R4, R5	139812	Resistor, Ww Fxd 30 W 5k Ohm Faston Te	2
21		198179	Bracket, Mtg Control	1
		202 525	Harness, Wrg Interconnecting (consisting of)	1
22	CR1	173069	Relay, Encl 12vdc Spdt 30a/20a 5pin Flange Mtg	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 11-2. Mounting Bracket w/Components (Continued)	
23		172731	Holder, Fuse Mintr .250 X 1.250 Clip Anti–pivot	2
	F1, F2	*169296	Fuse, Mintr Gl 25. Amp 125 Volt	2
24	2T	197147	Block, Term 5–4–3	1
25	D3	135184	Diode Board	1
26	D4, D5	189701	Diode/capacitor Board	2
	PLG12	148850	Socket, Relay 5 Pin	1
		200104	Conn, Push 6 Wire 12–16strnd 12–18sld 16–22tinstrnd	1
	RC25	158465	Conn, Rect Univ 084 12p/S 3row Plug Cable Lkg	1
	PLG35	177859	Conn, Body 5 Terminal	1
	PLG33, PLG34	153501	Conn, Rect Univ 039 6p/S 3row Plug Cable Lkg (service kit)	2
	PLG23	066 104	Conn, Rect Univ 084 6p/S 3row Plug Cable Lkg	1
		187654	Seal, Wire Univ 12p/S 3row	1
27	1T	172661	Block, Stud Connection 6 Position	1
28		173734	Link, Jumper	2
	PLG6	136924	Conn, Rect Comm 093 2p/S 1row Rcpt Cable Lkg	1
	PLG22	135134	Conn, Rect Univ 084 9p/S 3row Plug Cable Lkg	1
	RC7, PLG10	136925	Conn, Rect Comm 093 2p/S 1row Plug Cable Lkg	2
		198536	Harness, Wrg Feedback (consisting of)	1
	PLG9	135134	Conn, Rect Univ 084 9p/S 3row Plug Cable Lkg	1

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

♦Optional

*Recommended Spare Parts.

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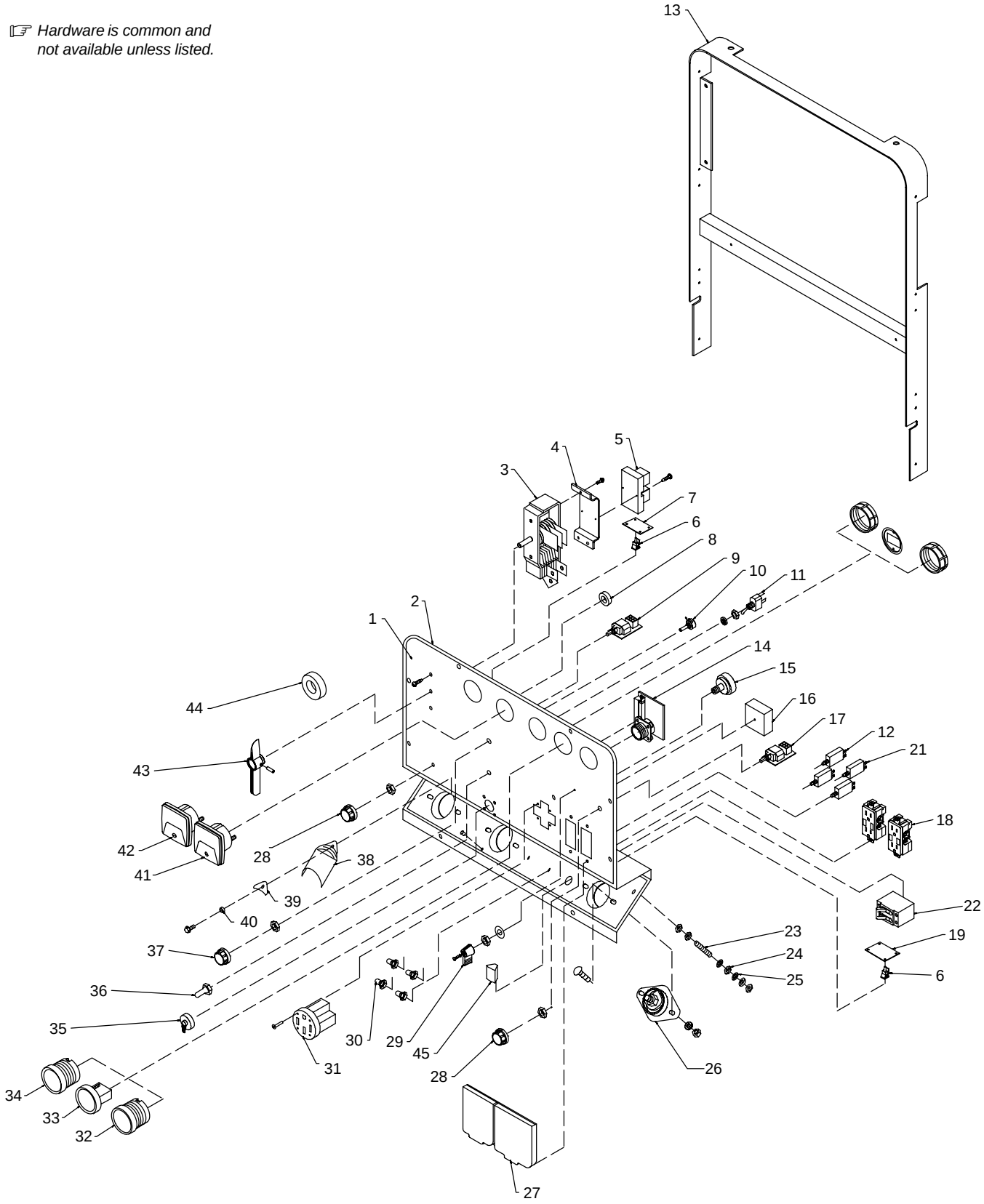

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Figure 11-3. Front Panel

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
Figure 11-3. Front Panel (Figure 11-1, Item 101)				
1			Nameplate (order by model and serial number)	1
2		203 030	Panel, Front	1
3	S1	187190	Switch, Changeover (Consisting Of)	1
4		187189	Bracket, Shunt Mtg	1
5	Shunt	030080	Shunt, Meter 50mv 400 Amp Lt Wt	1
		187121	Cable, Current Feedback 17 In	1
6		134 201	Stand–off Support, PC Card .312/.375w/Post&lock .43	6
7	PC5	148030	Circuit Card Assy, Filter Hf	1
8	CT2	♦200284	Xfmr, Current 310/5 W/Leads	1
9	S6	201 417	Circuit Card Assy, 6 Pos Switch W/Connector	1
		202 524	Harness, Wrg Control (consisting of)	1
10		035897	Pot, Cp Std Slot 1t 2. W 1k Linear	1
11	S3	011611	Switch,Tgl Dpdt 15a 125vac On–none–on Spd Term Chr	1
12	CB5, CB6	083432	Circuit Breaker,Man Reset 1p 10a 250vac Frict	2
	PLG8	135275	Conn,Rect Univ 084 15p/S 3row Plug Cable Lkg (service kit)	1
	PLG2	165668	Conn,Rect Metrmate 10skt 1row Plug Cable Lkg	1
	RC24	135134	Conn,Rect Univ 084 9p/S 3row Rcpt Cable/Panel Lkg	1
		187655	Seal,Wire Univ 15p/S 3row	1
13		198049	Upright, Base Front	1
14	PC4	147554	Circuit Card Assy, Connector/Receptacle	1
15	S2	198515	Switch, Ignition 4 Position (2 Moment)W/Out Handle	1
16	PC1	202124	Module, Pull To Idle 4 Pin	1
17	S7	201 413	Circuit Card Assy, 3 Pos Switch W/Connector	1
18	GFCI-4,5	151981	Rcpt,Str Dx Grd 2p3w 15/20a 125v *5–20r Gfi	2
19	PC3	148021	Circuit Card Assy, Filter Hf	1
20		Deleted		
21	CB3,CB4	093996	Circuit Breaker, Man Reset 1p 20a 250vac Frict	2
22	CB1	203 026	Circuit Breaker, Man Reset 2p 50a 240vac Screw–90	1
23		083030	Stud, Brs .250–20 X 1.750 W/Hex Collar	1
24		601836	Nut, 250–20 .50hex .19h Brs	3
25		010915	Washer, Flat .257idx0.640odx.031t Brs	3
26		099255	Terminal, Pwr Output Neutral	3
27		188039	Cover, Receptacle W/Gasket	1
28		097922	Knob, Pointer .875 Dia X .250 Id W/Set Screwsplstc	2
29		119014	Lever, Switch Black	1
30		206 795	Boot, Circuit Breaker Clear Hex Nut	4
31	RC3	182954	Rcpt, Str 3p4w 50a 125/250v Flush Mtg *14–50	2
32	PL1	191935	Led, Red 12.0v 4 Ind Lights Spl Panel Mtg Round	1
33	HM	118058	Meter, Hour 12–24vdc 2.25 Dia High Profile Stainles	1
34	FG	192265	Gauge, Fuel Elec Switch W/O Switchgage Sensor	1
35		170391	Conn, Circ Ms Protective Cap Size 20 Nylon	1
36		021385	Boot, Toggle Switch Lever	1
37		097924	Knob, Pointer 1.625 Dia X .250 Id W/Set Screwsplstc	1
38		186621	Boot, Generic Output Stud	3
39		180735	Washer, Output Stud	3
40		181169	Spacer, Output Stud	3
41	A	♦200230	Meter, Amp Ac/Dc 0– 310 0–420 Dc Scale 2.5 In	1
42	V	♦164874	Meter, Volt Ac/Dc 0– 100 Scale 2.5 In	1
43		115493	Handle, Switch Range	1
44	CT1	198623	Xfmr, Current Sensing	1
		048489	Clamp, Nyl 1.000 Clamp Dia X.500 Wide .203 Mtg Hole	1
45		203 016	Boot, circuit breaker 2 pole	1

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

♦Optional

*Recommended Spare Parts.

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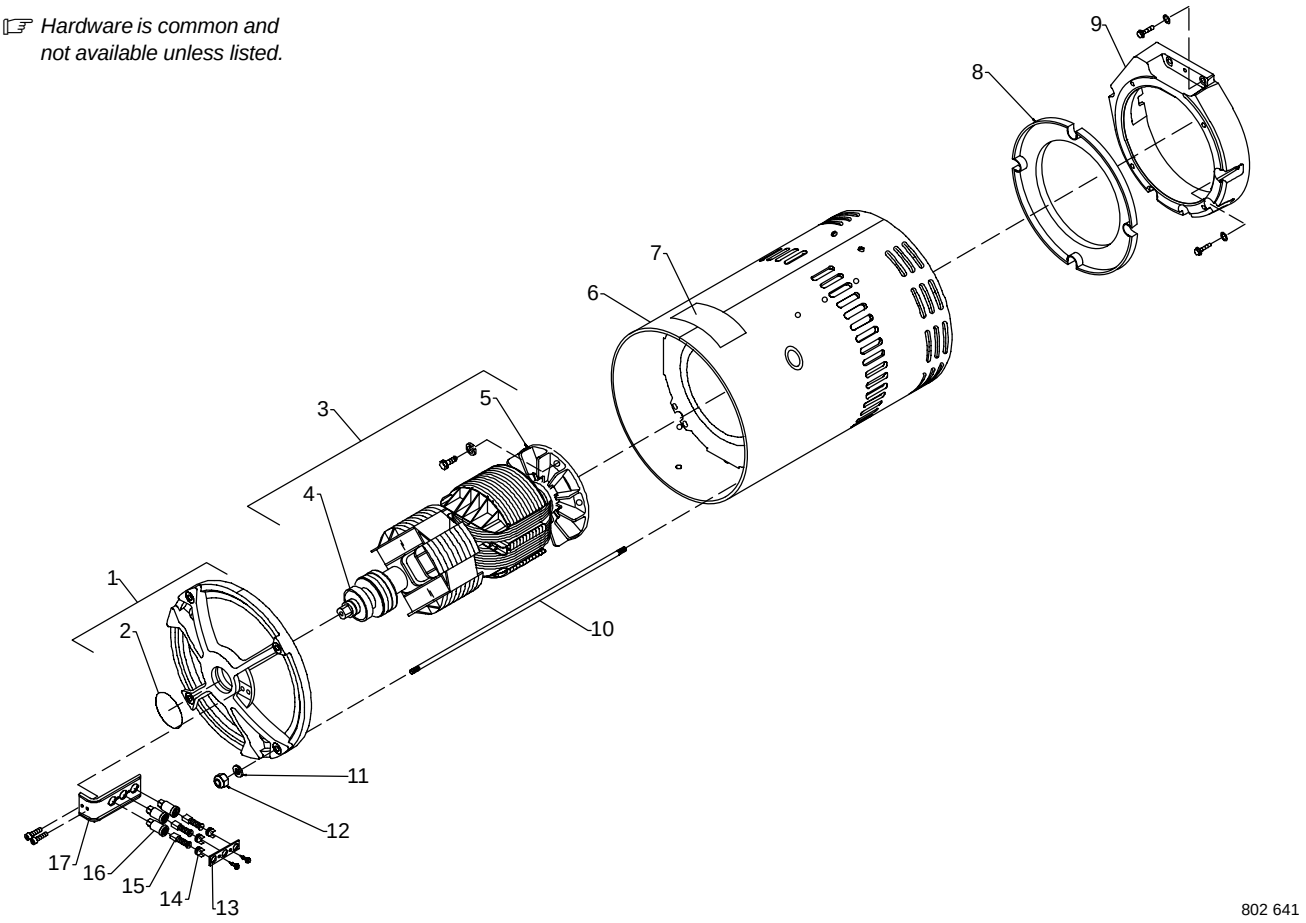

Figure 11-4. Generator

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 11-4. Generator Assembly (Figure 11-1, Item 37)	
1		187536	Endbell (consisting of)	1
2		183419	O–ring, 1.984 Id X .139 Cs 70 Duro Viton	1
3		203 686	Rotor, Generator (Consisting Of)	1
4		181143	Bearing, Ball Rdl Sgl Row .984 X 2.047 X .591	1
5		192600	Fan, Rotor Gen	1
6		+198930	Stator, Generator (Consisting Of)	1
7		013367	Label,Warning Moving Parts Can Cause Serious Etc.	1
8		159918	Baffle, fan	1
9		193515	Adapter, engine	1
10		187151	Stud, Stl .375–16 X 21.500	4
11		010910	Washer, Flat .406idx0.812odx.065t Stl Pld Ansi.375	4
12		010909	Nut, 375–16 .56hex .46h Stl Pld Elastic Stop Nut	4
13		047878	Bar, Retaining Brushholder 3 Brushes	1
14		161306	Cap, Brushholder	3
15		*126984	Brush W/Spring	3
16		005614	Holder, Brush	3
17		187183	Bracket, Mtg Brushholder 3 Brush Engine	1
	RC6	136924	Conn, Rect Comm 093 2p/S 1row Rcpt Cable Lkg	1
	RC10	136925	Conn, Rect Comm 093 2p/S 1row Plug Cable Lkg	1

+When ordering a component originally displaying a precautionary label, the label should also be ordered.
*Recommended Spare Parts.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

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1. 5 Years Parts – 3 Years Labor
   * Original main power rectifiers
   * Inverters (input and output rectifiers only)
2. 3 Years — Parts and Labor
   * Transformer/Rectifier Power Sources
   * Plasma Arc Cutting Power Sources
   * Semi-Automatic and Automatic Wire Feeders
   * Inverter Power Supplies
   * Intellitig
   * Engine Driven Welding Generators **(NOTE: Engines are warranted separately by the engine manufacturer.)**
3. 1 Year — Parts and Labor
   * DS-2 Wire Feeder
   * Motor Driven Guns (w/exception of Spoolmate Spoolguns)
   * Process Controllers
   * Positioners and Controllers
   * Automatic Motion Devices
   * RFCS Foot Controls
   * Induction Heating Power Sources
   * Water Coolant Systems
   * HF Units
   * Grids
   * Maxstar 140
   * Spot Welders
   * Load Banks
   * Miller Cyclomatic Equipment
   * Running Gear/Trailers
   * Plasma Cutting Torches (except APT & SAF Models)
   * Field Options
     (NOTE: Field options are covered under True Blue® for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
4. 6 Months — Batteries
5. 90 Days — Parts
   * MIG Guns/TIG Torches
   * Induction Heating Coils and Blankets
   * APT, ZIPCUT & PLAZCUT Model Plasma Cutting Torches
   * Remote Controls
   * Accessory Kits
   * Replacement Parts (No labor)
   * Spoolmate Spoolguns
   * Canvas Covers

Miller's True Blue® Limited Warranty shall not apply to:

1. **Consumable components; such as contact tips, cutting nozzles, contactors, brushes, slip rings, relays or parts that fail due to normal wear.**
2. Items furnished by Miller, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
3. Equipment that has been modified by any party other than Miller, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

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